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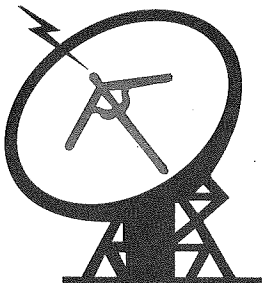
Carl Malamud
President

INTERNET
MULTICASTING
SERVICE

INTERNET MULTICASTING SERVICE



ABOUT THE INTERNET MULTICASTING SERVICE

Mondo 2000 calls it "definitely revolutionary." *The Associated Press* refers to it as a "glimpse of the future." *Popular Science* warns, "Move over, Larry King." And a *New York Times* front-page headline reads, "Turning the Desktop PC into a Talk Radio Medium." What these traditional print media are referring to is the world's first cyberstation, brought to you by the Internet Multicasting Service. Audio, text, and multimedia programs are distributed on the global Internet computer network, a network of networks that reaches 30 million people in over 150 countries.

With studios in the National Press Building and on Capitol Hill in Washington, D.C., the Internet Multicasting Service is a non-profit station in cyberspace, designed as a professional, informative source of news and information about public affairs, science, and technology. A pioneer in bringing audio to the Internet, IMS features a wide variety of programming, including live events from the Kennedy Center for the Performing Arts and National Press Club luncheon speakers such as the Dalai Lama of Tibet; Vice President Al Gore; Tenor Jose Carreras; Larry King; and Yassar Arafat.

Other programs include the *Geek of the Week* interview, and numerous programs from public broadcasting including *Technation*, *Dialogue*, and *Common Ground*. The Internet Multicasting Service's is the producer of the *HarperAudio!* program, featuring distinguished figures from the arts and letters such as T.S. Eliot, Robert Frost, J.R.R. Tolkien, and Ernest Hemingway reading their own works. Multimedia productions have put a wide variety of groups on-line, including the Red Sage Restaurant, City Lights Books, the French Embassy, the Wine Specialist, and the Wilderness Society.

In addition to regular daily programming, the Internet Multicasting Service produces special events, such as a first-ever live audio link between National Public Radio's *Talk of the Nation/Science Friday* and the global Internet. The Global Schoolhouse Project allowed children in London and the United States to brief senior government officials via an Internet videoconference about the results of their research on the environment. The North.Pole.Org on-line Santa Claus fielded 1.2 million World Wide Web queries from 64 countries.

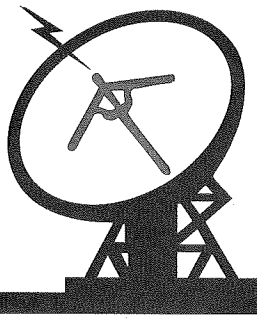
Periodically, the Internet Multicasting Service goes in the field to cover conferences, trade shows, and other live events for the Internet. In December, 1994, we ran a 2-channel TV station for the Internet Engineering Task Force, allowing people in all over the world to participate in working group sessions in San Jose. In May, 1994, a live cyberstation was produced in Las Vegas, featuring live interviews on the Internet with government officials in our D.C. studios, live talk shows, and cheap stunts ranging from the Internet Slot Machine to a computer-controlled toaster. Other conference from Prague to Chicago have all been put on-line, allowing listeners to see photos, slides, and listen to talks while browsing related on-line archives.

The Internet Multicasting Service is not limited to audio. Under a grant from the National Science Foundation, 1994 and 1995 Patent and SEC documents are available free on the Internet. The project was heralded by the *New York Times* as a "U.S. Shift To a Freer Data Policy," and current efforts to expand the project to include back years was heralded by Vice President Al Gore as "a big win for the American public."

On January 4, 1995, the Internet Multicasting Service went on air 24 hours per day. Featuring the RT-FM modern rock music channel and the World Radio Network news and information feed, the cyberstation sends out real-time audio to listeners around the world. For the Congressional Memory Project, every word said on the floors of the U.S. House and Senate are sent out live as well as stored on disk for an audio-on-demand server. Other live events include Handel's Messiah, sent out live from the Kennedy Center karaoke style, complete with a bouncing ball.

Continuing major support for the Internet Multicasting Service is provided by Interop Company, MCI, O'Reilly & Associates, and Sun Microsystems with additional support for on-line government databases coming from groups including RR Donnelley Financial and Time, Inc. In-kind contributions come from MFS Datanet, UUNET Technologies, Cisco Systems, Persoft, WAIS Inc., and others. Many of the Internet's leading researchers and engineers have contributed their time to Internet Multicasting Service programs.

INTERNET MULTICASTING SERVICE



MEET THE INTERNET MULTICASTING SERVICE

Carl Malamud, President and Founder. Carl founded the Internet Multicasting Service on April 1, 1993, with the debut of *Geek of the Week.* What was meant to be a hobby turned into a cyberstation and today Carl works on projects such as putting the Patent database on-line, establishing 24-hour operation of the cyberstation, and participates in numerous "cheap stunts" such as the world's first-ever karaoke multicast of Handel's Messiah on the Internet, live from the Kennedy Center.

Malamud is the author of seven professional reference books, including *Exploring the Internet: A Technical Travelogue* (Prentice Hall, 1993), *Stacks* (Prentice Hall, 1992), and the three-volume series *Analyzing Networks* (Van Nostrand Reinhold, 1991-1992). He has served as a consultant to agencies and firms throughout government and industry, including the Board of Governors of the Federal Reserve System, the Joint Chiefs of Staff, the Office of Technology Assessment (U.S. Congress), Sun Microsystems, AT&T, and many others.

Luther Brown, Vice President, Programs. Luther Brown has extensive experience as an award-winning producer and reporter, first at CBS and then for 13 years at NBC Nightly News. At IMS, Luther coordinates our congressional coverage and press relations, and serves as the voice of Santa Claus. He completed doctoral course work in English at Rutgers and has a J.D. from Georgetown University Law Center.

Martin Lucas, Musical Director. Marty Lucas is the producer of *Geek of the Week* and *SoundBytes* and writes and produces all our original music. Marty serves as town attorney for North Judson, Indiana and manages one of the largest prairie restoration projects in the midwest. He has degrees in Anthropology and Law from Indiana University.

Corinne Becknell, Artistic Engineer. Corinne Becknell is the voice of Logana on SoundBytes and is installed in user interfaces throughout the Internet. In addition to her announcing and singing duties, Corinne manages audio production for our North Judson studios and is Musical Director for her church.

Stephanie Faul, Producer. Stephanie Faul is producer of *HarperAudio!* and does numerous special projects for the Internet Multicasting Service. Stephanie has an extensive background as a freelance writer for a variety of national magazines and has served as editor of publications such as *AAA World* magazine. She possesses one of the largest private collections of dictionaries in the metropolitan area.

Rick Dunbar, Chief Engineer. Rick Dunbar has extensive experience supporting high-end Unix installations in places such as the Smithsonian, NASA Goddard Space Flight Center, and the Pentagon. Rick is lead engineer for the Internet implementation of The Phone Company and serves as our resident expert in subjects ranging from X to PERL to any makefile that won't behave. Rick studies karate and doubles as bouncer in the User Services Department.

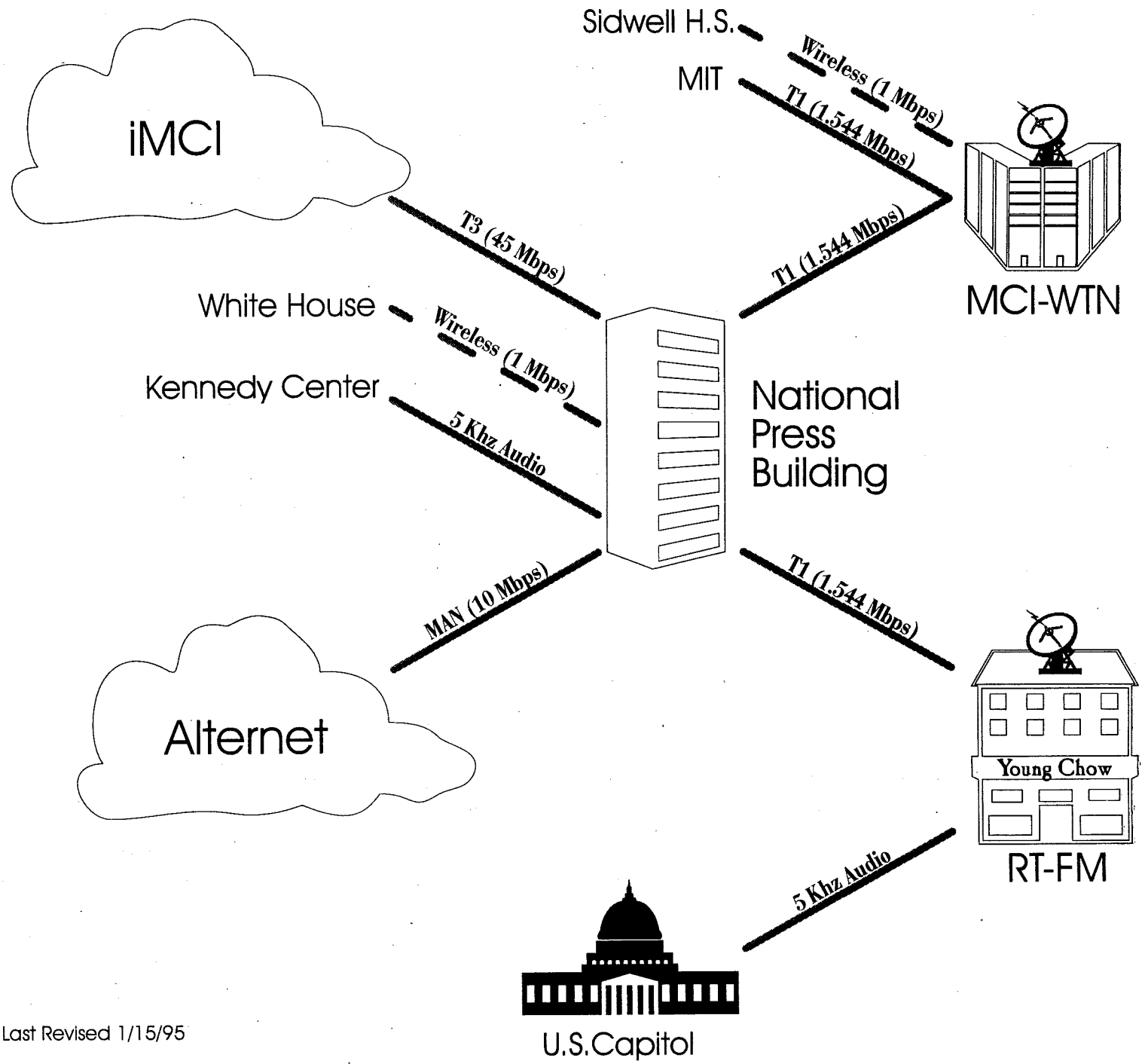
Brad Burdick, Also Chief Engineer. Brad Burdick is our lead programmer on the effort to liberate government databases and was responsible for public release of the SEC EDGAR database to the Internet within 10 days of the receipt of our first tape. In addition to serving as the shadow MIS department for the SEC, Patent, and other government groups, Brad is our resident expert on Solaris and operating systems.

Curtis Generous, Engineer Of Counsel. Curtis Generous has worked as lead analyst for numerous projects in organizations such as NASA. VP of Engineering at UUCOM, Inc., Curtis supports the Commercial Internet Exchange and is an expert in establishing new Internet service providers. He wrote the "talk-to-Santa-Claus" PERL script and is our expert on arcane topics such as sendmail. A native of the French Riviera, Curtis has an EE degree from the U.S. Merchant Marine Academy and is a licensed magician.

Philippe Tabaux, Production Engineer. A Ph.D. candidate in computer imaging at the University of Paris, Philippe is our resident photographer and PC expert. He boasts one of the world's leading collections of coke bottles and grew up on a farm 100 miles west of Paris.

INTERNET MULTICASTING SERVICE

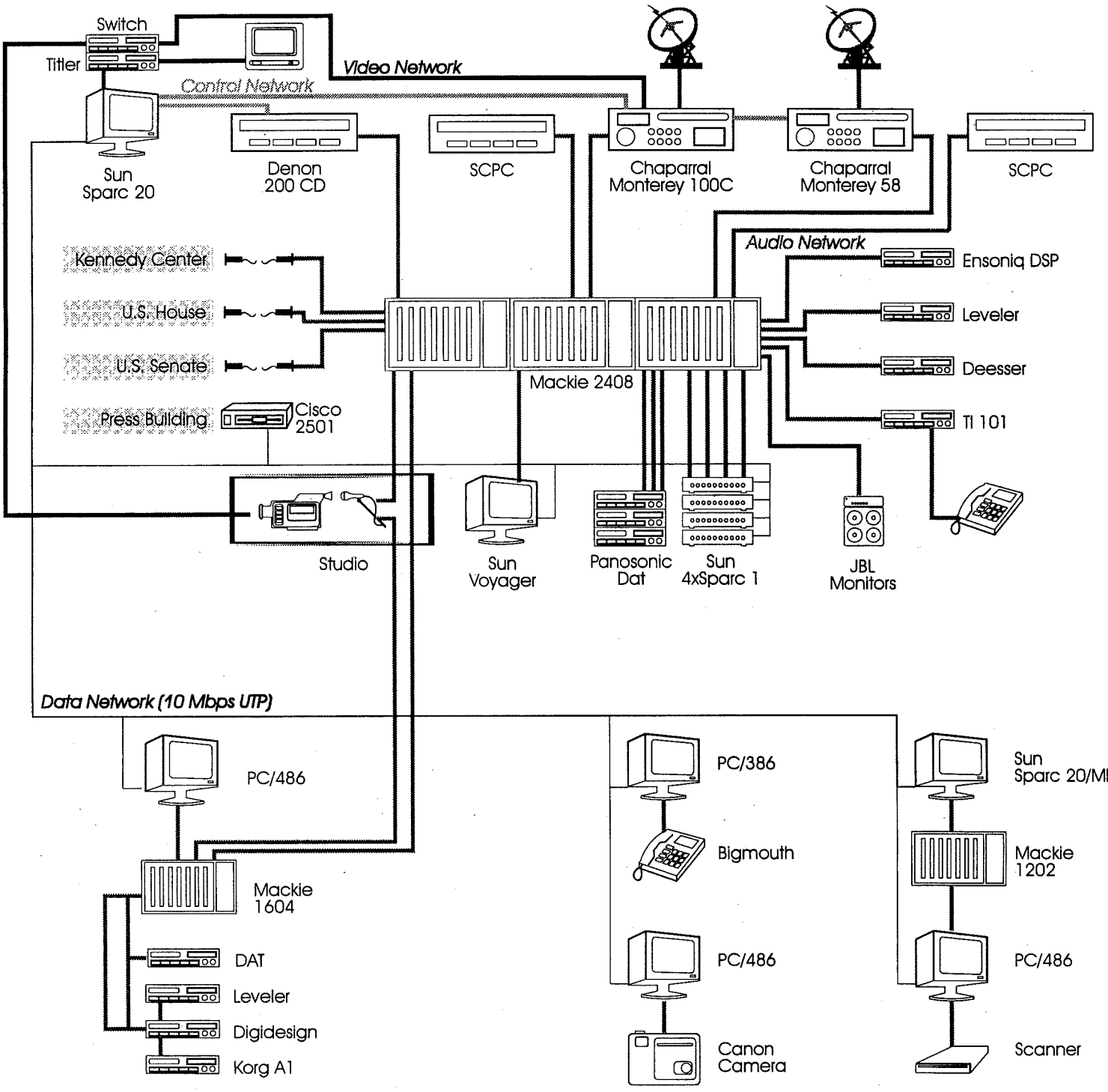
Overview of IMS Network



Last Revised 1/15/95

INTERNET MULTICASTING SERVICE

RT-FM Network Topology



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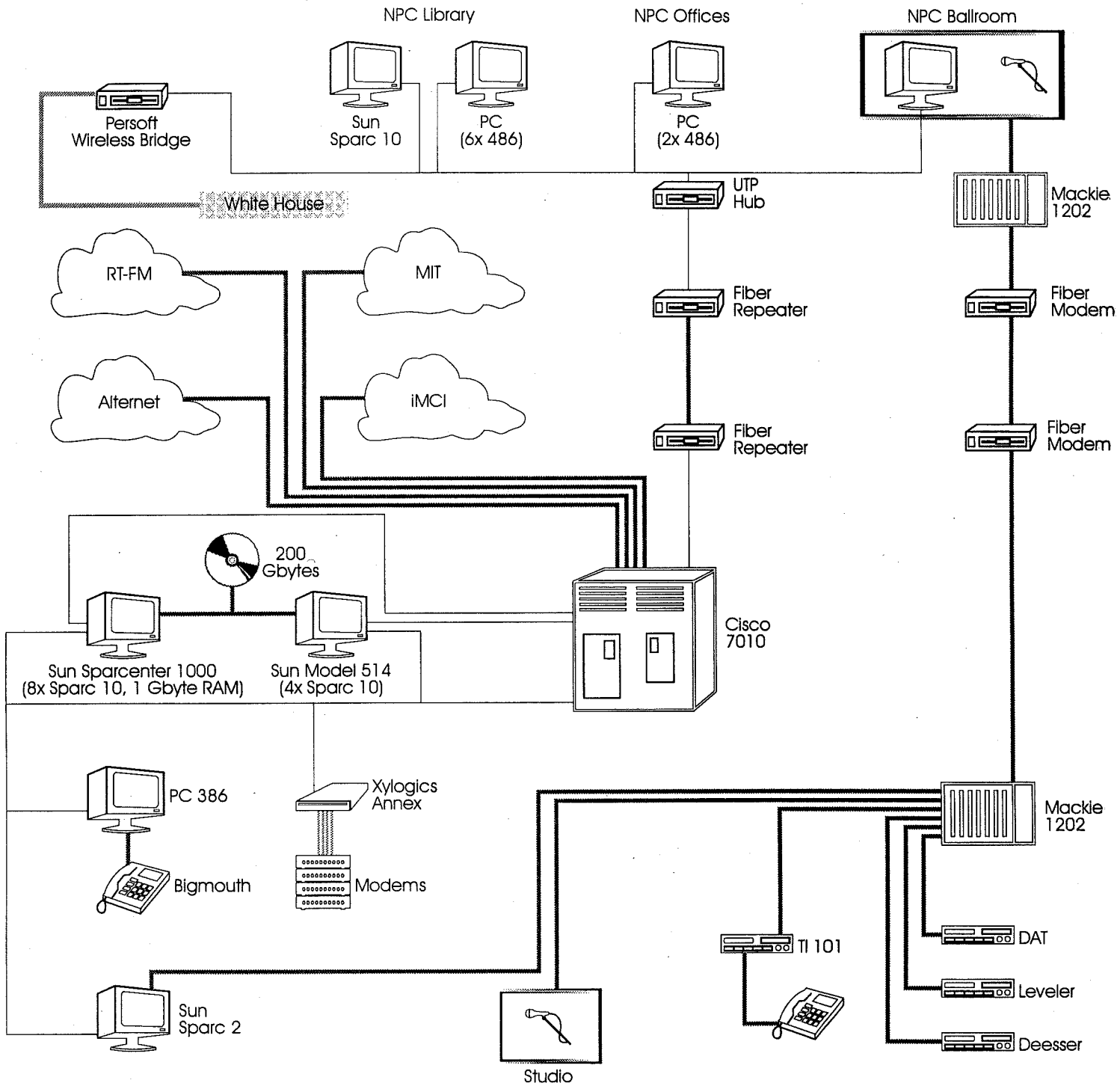
INTERNET MULTICASTING SERVICE

National Press Building Network Topology



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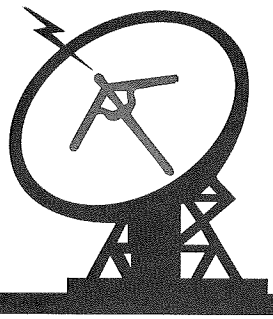


THE CONGRESSIONAL MEMORY PROJECT

When Marshall McLuhan said "the medium is the message," he was right in many ways. Too often, the Internet has been a forum where computer science discussions dominated. Finally, the medium *isn't* the message! The Congressional Memory Project is an attempt to use global computer networks as a way of enhancing the democratic process, at the same breaking new technical ground for large audio archives.

Beginning January 4, 1995, the Internet Multicasting Service started live coverage of the U.S. House of Representatives and the U.S. Senate. Every word said on the floor of these august bodies is sent out live on the Internet computer network as real-time audio streams, using a technique known as multicasting. People as far away as Australia and Finland have been tuning their computers to listen to the proceedings.

In addition to sending out the audio as live streams on the Internet, IMS is making a copy of the audio data and storing it on large disk drives on our main servers. Using a variety of techniques, we are developing an audio-on-demand server. The goal of the project is to store an entire session on-line and to allow Internet users to search for relevant speeches using keywords. For example, a user might ask for all foreign policy speeches by Speaker Gingrich during the last week.

A variety of strategies are being used to add this functionality to our server. First, we are coupling the audio archives to the text contained in the Congressional Record. Using a variety of text-processing techniques, we are re-indexing the Congressional Record so that it "points" into the sound files on our server. A second strategy is to use the emerging field of speaker recognition to index the sound files. This technology shows great promise for small populations, such as Congress.

In addition to enhancing the functionality of the software, we are also expanding the scope of our coverage. The current link to the U.S. Capitol uses 5 khz dedicated audio lines to connect to our Capitol Hill studios, where the data is processed and sent out over our network and onto the Internet.

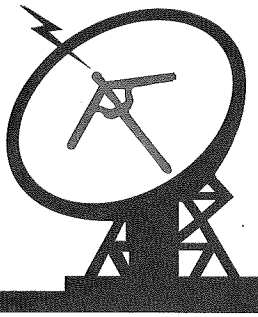
A "pool feed" is made available to members of the media, containing popular Congressional Hearings and other events. As members of the House and Senate TV-Radio Galleries, the Internet Multicasting Service is allowed to tap into these pool feeds. Working with WETA, a public television station, we will be expanding our coverage to add Congressional Hearings and other events by connecting our 5 khz audio lines to a router/switcher that WETA has installed.

The pool feeds are brought into the Capitol hub rooms using a fiber optic infrastructure that goes through much of the Capitol complex. This infrastructure is used for audio and video lines by TV and radio networks, but the fiber optic cable works for data as well. The next step for the project will be to install a leased digital T1 data line into the hub rooms in the basement of the U.S. Capitol. We can then place a computer in a rack, tying that into the various pool feeds as well as the fiber going through the Capitol complex. The end goal is to allow us to put any hearing onto the Internet, sending out up to 8 simultaneous audio/video feeds from the Congressional complex.

The Congressional Memory Project will be developed throughout 1995 and 1996. As with all IMS projects, this one will open the construction site to the public, allowing users to immediately start listening to the live broadcasts. Over the next two years, we will continue to add functionality to the system, ranging from the audio-on-demand server, to adding the pool feeds, to extending the Internet right into the hearing rooms.

The potential for this technology in our government more open and responsive is very promising. The audio-on-demand server will be invaluable to lobbyists and congressional staff who missed a key speech. Longer-term searches will be useful to scholars, students, and members of the general public who wish to hear key speeches. Bringing the Internet into the hearing rooms raises the possibility of sophisticated participation in the process, allowing the public to listen to hearings while looking at related background information and sending their own messages straight into the hearing room.

INTERNET MULTICASTING SERVICE



THE INFORMATION HIGHWAY BEAUTIFICATION FUND

"I'm pleased to see that the private sector is teaming up with the Administration and some of America's leading researchers to expand taxpayer access to these important government databases over the Internet. This is a big win for the American public."

Vice President Al Gore

Background

Several large government databases are key to making information-intensive industries work. People who read 10K reports buy stocks; people who search for patents create new knowledge; people who search trademark databases create new products and services. These databases are fuel for the information economy.

In January, 1993, the Internet Multicasting Service and New York University started a project to put large government databases on the Internet computer network. Partially funded by the National Science Foundation and supplemented by general revenues from the Internet Multicasting Service and corporate in-kind donations, the project distributes current SEC EDGAR and Patent documents at no cost on the Internet.

The project was very well received, hailed by the *New York Times* as a "major shift" in the way government information is made available to the public. The project quickly moved beyond prototype stage and today the main town.hall.org Internet server distributes close to 15,000 documents per day, using protocols ranging from low-end electronic mail to high-end graphical interfaces such as the World Wide Web. The *New York Times* called EDGAR "the world's most valuable financial database" and *WIRED* calls the project "a vital precedent."

The Information Highway Beautification Fund is a fund administered by the Internet Multicasting Service, a 501(c)(3) non-profit corporation with offices in the National Press Building in Washington, D.C. The Fund pools the resources of a large number of participants from industry, government, and universities to provide a solution to how to make government data readily available on the information highway.

The Fund's Charter

The Fund's main purpose is to guarantee the maintenance, distribution, and improvement of key government databases on the Internet computer network. These databases will be available, within certain technical constraints of capacity, at no charge to Internet users and to users of connected computer networks.

The Fund is not meant to replace government efforts to place databases on-line; it is meant to provide a medium-term boost for those very large databases that are difficult to put on-line. The Fund assumes that groups of corporations and users have an incentive to see these databases on-line. The financial industry, for example, benefits greatly when the SEC documents are widely available, thus promoting greater levels of economic activity.

The Fund is governed by two groups. A Policy Committee provides policy input and is comprised of representatives of corporate sponsors. The Technical Committee provides technical leadership and is comprised of distinguished researchers and engineers from around the Internet. In addition to acting as a secretariat for the Fund, the Internet Multicasting Service will provide a variety of services, including providing an on-line consumer forum, an annual report, and other support activities. The secretariat functions on a year-to-year basis and the Policy Committee is free to choose another secretariat for out-years.

The 1995 goal for the Fund is to maintain servers with a disk capacity of 500 Gigabytes located at computers in Boston and Washington, D.C. The 1995 target for databases is to maintain all years of Patent and Trademark text data and all 1994 and 1995 SEC data. A variety of smaller databases will also be supported.

Technical Volunteers Program

The work of the Technical Committee will be supplemented by a volunteer program. Prominent Internet engineers are being asked to devote 3 days of their time as pro bono consulting during 1995 to help improve the value of the data. Initial volunteers include:

- Dr. Marshall Rose, First Virtual
- Dr. Steve Deering, Xerox Parc
- Dr. Michael Schwartz, University of Colorado
- Tim O'Reilly, O'Reilly & Associates
- Jeffrey Schiller, MIT
- Dr. Nathaniel Borenstein, First Virtual
- Winston Dang, University of Hawaii
- Jim Fulton, CNIDR
- Don Hoffman, Sun Microsystems
- Geoffrey Baehr, Sun Microsystems
- Karl Auerbach, Cave Bear Technologies

The Internet Multicasting Service is providing a meeting place where corporate contributions provide a platform that some of the Internet's most talented engineers and researchers will use to make government information more useful. This volunteer SWAT team will look for ways to make the databases more powerful, the distribution of data more efficient and secure, and the user interfaces more intuitive.

Large government databases are an ideal environment for this kind of research and both the scientists and the general public will benefit as new techniques are applied to make public data more useful.

Some of the enhancements we hope to develop include a "wire service" that sends out a low-volume stream of text data over the multicast backbone; cross-linking of databases so that a user can navigate from one database to another using a World Wide Web browser; attribute-value indexing of the data to provide a more powerful search language; and, distribution of the data between two sites using the "Internet Railroad."

Sponsors

Sponsors contribute tax-deductible cash or in-kind donations. Sponsors will be acknowledged on the "Home Page" of the service, and also on each document "hit" as follows:

> Support for distribution of this document was provided by the sponsors of this service including Foo Inc.

The underlined phrases are links to a page describing all the sponsors and the page describing that particular sponsor (or the sponsor's own on-line presence if that group has one). It is not unlikely that this system will have over 100,000 hits per day, providing a daily exposure for each sponsor of several thousand hits. We believe that the direct advertising exposure, coupled with the long-term beneficial impact on information industries will make a contribution to the fund something that can be justified as a rational business expense.

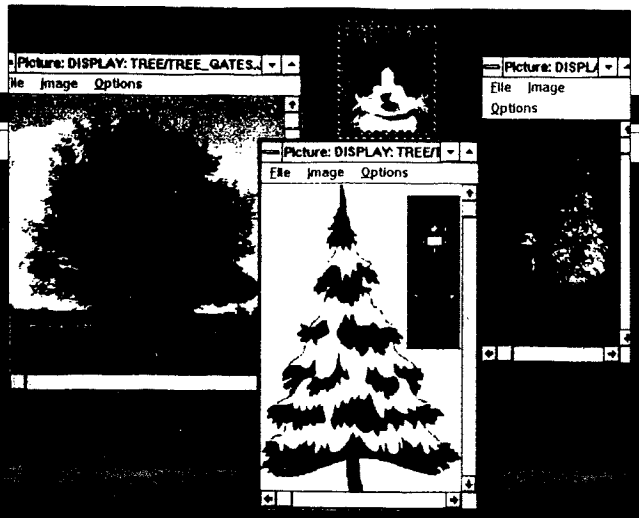
Initial sponsors of the fund include the following organizations:

- Massachusetts Institute of Technology will provide a staffed machine room for the server with network connectivity.
- New York University will continue to make research into government data a research priority.
- Sun Microsystems will provide a server system.
- MCI will provide telecommunications facilities including a dedicated T1 line between Boston and Washington.
- RR Donnelley Financial will provide $100,000 and internship opportunities for the NYU students.
- Time, Inc. will provide 4 ads in Fortune Magazine and in Pathfinder for publicizing the Fund.

The Fund was announced in December, 1994. The transition from a prototype service at Internet Multicasting to a permanent service at MIT will begin January, 1995 with a machine transition currently planned for April, 1995. By January, 1996, the transition will be complete and the system will be in full production.

Newsweek
12/12/94 P. 12

Cyberscope



Socks, soldiers and trees—but no eggnog: From the Web site

CHRISTMAS

Deck the (Virtual) Halls

DEAR SANTA: FOR CHRISTMAS, I WOULD LIKE (1) SOME money to give to charity, (2) a Christmas tree that won't shed all its needles by New Year's, (3) a rough idea of what Rudolph likes to snack on, (4) an instant response to this letter. Please."

To fulfill these and other Christmas wishes, point your browser to (http://north.pole.org) and have a look around. Learn about penguin life at the North Pole. Write to Santa Claus, checking off a box that tells him whether you've been good or good this year—and get an immediate, personalized reply. Try favorite reindeer recipes for algae newtons and moss snaps. Help out Second Harvest Food Bank, Chesapeake Wildlife Heritage and the Harlem Educational Activities Fund: each time you connect to a charity page at this site, a corporate sponsor makes a 10-cent donation to that group. Finally, try decorating a high-resolution tree with bows, bells and new, hot-off-the-shelf Socks the Cat ornaments. The only drawback to all this online merrymaking? No tinsel.

NEW YORK POST **BUSINESS** THURSDAY, DECEMBER 22, 1994

Giving to charity on the Internet

This holiday season, not only can the mother of all computer networks be explored, but if the right places on the Internet are visited, four cash-rich companies will donate oodles of money to four needy charities.

"Sounds neat. That's because it is," said Carl Malamud president of Internet Multicasting, a nonprofit organization based in Washington, D.C.

Malamud's group uses the Internet to make Securities and Exchange Commission filings available to the general public, but this Christmas it has set up an Internet address called 'north.pole.org.'

Internet Multicasting helped four community organizations construct homepages, and then matched them with four hightech companies.

"Each time someone visits the homepage of one of our selected groups, the corporate sponsor will donate ten cents. They've agreed to donate up to $46,000," said Malamud.

North.pole can be reached by pointing your Internet browser to http://north.pole.org.

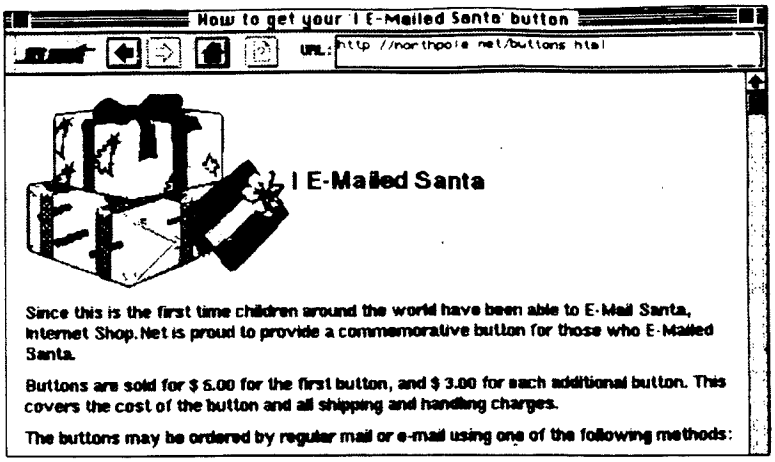
Cutting Edge

COMPUTING/TECHNOLOGY/INNOVATION

Santa, Plz Snd Legos & Barney, Thx

■ **Internet:** More than a million kids this year have e-mailed their wish lists to a virtual North Pole.

By AMY HARMON
TIMES STAFF WRITER



Some of the Internet Santas are more capitalistic than others. One site, shown here, is selling "I E-Mailed Santa" buttons for $5.

In the olden days, the Alder kids used to send letters to Santa up the chimney. This year, like more than a million other true children of the electronic age, they filed their requests over the Internet.

"E-mail is faster and easier, and you get a response," says the pragmatic Corey, your typical 11-year-old computer jock. The elder Alder typed in his little brother Sam's list (Legos, cap gun, Power Rangers costume) and sent it to Santa at the digital North Pole last week. One of them, that is.

At last count, Santa had accumulated some 13 e-mail addresses this year, plus at least five sites on the World Wide Web. Once a cute novelty for the fiber-optically inclined, cyber-Santas are now populating every virtual street corner on the global network.

And while the computer-generated Clauses have done their share to spread on-line cheer, a number of them are out to turn a profit too. One site encourages users to purchase a commemorative "I E-Mailed Santa" button for $5.00.

Another displays an on-line catalogue of "Santa's Christmas Favorites." "Sure, Santa and commerce are inextricably linked," grumbled one parent on-line, "but is the big guy so strapped for cash that he has to turn the workshop into a showroom?"

As cyber-Santas emerge as a favorite publicity-generator for several of the Net's emerging enterprises, they are also encountering—and coping accordingly—with some challenges not necessarily common in the analog world.

Spamming, for instance.

A nonprofit Santa site on the World Wide Web, hosted by the Internet Multicasting Service, recruited several firms to donate a dime to a local charity for every time a user logs onto its site—up to a predetermined limit.

Last week, a (perhaps well-meaning) message was sent out over the network, encouraging people to "spam Santa,"—Net-talk for flooding the site with mail. Within a few days, the site had received 200,000 letters many written by computer programs designed to send up to 6,500 messages at once.

Carl Malamud, Elfmaster and president of the service, countered with an electronic posting to several Internet newsgroups: "On behalf of Mr. Claus and the Elves, I'd like to say that mailbombs to Santa and the Elves will result in immediate removal of your name from the 'good' list and a transfer to the 'bad' list."

Internet Access Inc., an Ottawa-based firm, escaped a spam attack, but has nevertheless been deluged with nearly 5,000 letters a day to Santa since publicizing its North Pole address earlier this month.

So the company recently sent an urgent plea for aid out on the Net, with the subject line S.O.S. (Save Our Santa): "Santa needs corporate help to finance his sleigh . . .If your company would like to sponsor northpole.net, please email. . . ."

Usually, reaching Santa by e-mail offers a critical benefit that the more traditional forms of correspondence do not: a reply.

Several of the services use automatic, computer-generated replies. Malamud's Christmas computer scans for popular requests and inserts a predetermined response (boys who request Cindy Crawford, for example, are told that "Rudolph says don't hold your breath.").

Internet Access has "instructed the elves to remember, Santa does not promise anything, nor does he say he can't get anything," administrator Mary-Ellen Heney says.

Says Loren Hudson, a Santa Rosa parent who helped his 5-year-old sons Peter and Christopher send e-mail to the Santa sponsored by Internet Media Services: "When you send an anonymous post to the North Pole, you don't often get something back. I think they'll remember it and ask to do the same next year. And we probably will."

North Poles

Here are some Internet addresses for Santa letters and "visiting" the North Pole.

http://northpole.net/santa.html

http://www.neosoft.com/citylink/xmas/default.html

http://north.pole.org

http://north-pole.w3.com/santa

http://www.dash.com/netro/fun.fun.html

santa@newslink13.com
santa@chris.com
santa@north.pole.org
sclaus@mcimail.com
mcsanta@aol.com
santa@delphi.com
santa@novalink.com

THE NEW YORK TIMES, THURSDAY, DECEMBER 15, 1994

Life on the Internet

Christmas Spirit Misfires As Santa Gets 'Spammed'

By PETER H. LEWIS

The bad side of Santa Claus's "naughty and nice" data base just swelled by several megabytes, computer experts said yesterday, after unknown Grinches bombarded his North Pole Internet address with thousands of Christmas letters.

"Santa got spammed," said Carl Malamud of Washington, referring to the practice, reviled in cyberspace, of sending out a bulk mailing of unsolicited letters or messages. Mr. Malamud, president of the Internet Multicasting Service, manages Santa's electronic mail, cookie recipe, Christmas jingle and volunteer information center on the global network of computers.

What started as a high-tech "Cyberspace Christmas" fundraising effort by several civic-minded organizations appears to have backfired, at least temporarily, said George Paolini, corporate information manager for Sun Microsystems Inc. of Mountain View, Calif.

Sun was one of four companies that promised to donate 10 cents each time someone used the Internet's World Wide Web electronic publishing resource to read about a specific charity.

Although more than 30 million computer users worldwide are thought to have the ability to send electronic mail messages to Santa by using the Internet, only about 2 million people are believed to have the advanced technical tools needed to visit Santa's "home page" on the World Wide Web. People with access to the World Wide Web can visit Santa's Cyberspace Christmas center at the URL: http://north.pole.org.

But at least some Internet users apparently misinterpreted the offer, thinking that Sun and the other companies, including Ex Machina Inc., would donate 10 cents each time Santa received an electronic mail letter.

Because there are no stamps in cyberspace, there is no penalty for sending lots and lots of letters. People started adding Santa's E-mail address — santa{a}north-.pole.org — to the "cc" of every message they sent.

Quickly, word of the charity offer spread throughout the Internet, and programmers began sending "mail bombs" of hundreds of messages an hour to Santa to accelerate the donations.

"When we got in this morning, there were 42,000 messages in Santa's mail queue," Mr. Malamud said. Still, he said, it caused only a temporary hiccup in the system, and he promised that legitimate letters to Santa from children around the world would continue to be delivered.

"I'm sure there was no malicious intent on anyone's part," said Mr. Paolini of Sun, which plans to donate $25,000 to the Second Harvest Food Bank in San Jose, Calif. "Obviously the intent here was to generate funds for the needy."

Art Bits

The Kennedy Center was the starting point of a futuristic sing-along Friday night, when the Internet Multicasting Service broadcast the annual "Messiah" concert over the Net in conjunction with the center's ArtsEdge project. Handel fans in cyberspace could accompany the digitally transmitted audio feed with lyrics (complete with electronic bouncing ball) on their home computer screens . . . The National Museum of American History starts a week of holiday celebrations today, with events planned from noon to 4 p.m. daily through Saturday. The multicultural activities will celebrate Hanukah, Kwanzaa, Christmas and the new year. Call 202-357-2700 for details.

SING ALONG WITH HANDEL

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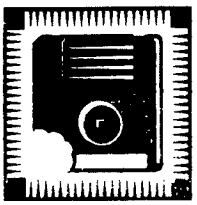

Christmas choral favorite as performed at Kennedy Center. The sounds that flowed out across the Internet were coordinated with an on-screen "white board," on which a bouncing ball moved from word to word.

The project was the work of the Washington-based Internet Multicasting Service, which sends out regular audio programs on the network and plans to launch a 24-hour audio service in January. It did not exactly draw a mass audience. Internet Multicasting's Carl Malamud said only about half a dozen people listened in, from Switzerland, London, California and other locations. ■

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9.	MS-DOS 6.22 Upgrade for Dummies	Microsoft/IDG
10.	Quicken 8.0 for DOS	Intuit

NY Times
12/25/93

Now Santa Slides Down The Electronic Chimney

By MICHELLE QUINN

Special to The New York Times

SAN FRANCISCO, Dec. 24 — Santa Claus may still be stuck in the reindeer-and-sleigh era, but give him some credit: He has figured out cyberspace.

This season, Santa Clauses have sprung up in cyberspace like St. Nicks in shopping malls. One digital Santa even claimed to be searching data bases to determine who has been naughty or nice.

Santas on-line seem to be collective wishing wells, filled with requests for toys, peace on earth, expensive cars, Cindy Crawford, new computers, wedding proposals and exotic holidays.

G.I. Joes and College Majors

Requests sent to one electronic mailbox included a request from little Nick for G.I. Joe equipment for himself and a Barbie swimming pool for his sister. A mother sought advice on how to steer her son away from violent video games. Chad wanted Santa "to give me direction in my college career."

The cyber Santa receiving these messages, Carl Malamud, president of the Internet Multicasting Service, a Washington-based nonprofit group devoted to Internet services, said that each morning he separated children's requests from adults' and placed each piece of mail in categories — like a Porsche file, a Train file, a Thesis Trouble file (for anguished graduate students). His Santa could be reached at santa@north.pole.org or elves@north.pole.org.

To Chad, Mr. Malamud's Santa wrote: "Rudolph sends his regards. You should study hard or you'll end up like him, eating moss all day and pulling a sled at night."

Mr. Malamud said he got the idea when someone asked him if Santa was on the Internet. When he could not find one, he decided to be it, he said. He expects 10,000 requests before Christmas Day, which his Santa calls "the big product release."

A Public Trust

"I don't promise any specific toys," Mr. Malamud said. "But one kid said he wanted a book, and that did not seem like much, so I said 'O.K., you're getting a book.' I typically have Rudolph make the promises so that Santa can disavow them later, if necessary."

He declined to get involved in sibling disputes — "Susie's been very bad," and so on. But he did intervene for four people seeking Santa's help mending troubled romantic relationships, sending conciliatory Santagrams to loved ones. But he is careful with playing electronic Santa, he said, because it is a public trust.

Other high-tech Santas were offered to subscribers of on-line services like Prodigy, Genie and Delphi Internet Services. At Digital Nation Inc., a nonprofit on-line service based in Alexandria, Va., four staff members answered electronic mail for a Santa reachable at the Internet address santa@csgi.com.

Bruce Waldack, president of Digital Nation, said "interfacing" with Santa was a way to lure people into the electronic community.

"We believe strongly that this is the post office of the future," Mr. Waldack of Internet said. "We are trying to bring something that is more traditional, like Santa Claus, into the digital age."

Santa gets Christmas 'spam'

BY DAVID POULSON
GAZETTE LANSING BUREAU

Santa's entry into high-tech communications has created a whole new way to get on his naughty list.

You "spam" him — Internet jargon for deliberately overloading an e-mail address with thousands of messages. Users of the computer network are sending them in the mistaken belief that the more they send, the more money corporations will give to charity.

"It's the 'mail bombs' that kill us," said Carl Malamud, who bills himself as Santa's elfmaster. "Instead of writing 10 notes, someone says, 'I'll write a program that sends 5,000.' "

Malamud, president of the Washington, D.C.-based Internet Multicasting Service, operates one of the nation's hottest mail rooms for Santa's e-mail. He has had to put a dozen computers to work to handle a flood of Christmas requests for everything from the usual toys and gadgets to a visit from Cindy Crawford and

GAZETTE NEWS SERVICE

help with exams.

The heavy volume is the result of a widely posted notice on the Internet that says corporate sponsors have agreed to contribute a dime to charity for every message Santa receives at Malamud's nonprofit corporation.

Actually, the contributions were tied to the number of electronic visits made to Santa's World Wide Web page, which is a way to get information and photos over the Internet, Malamud said. And those contributions were capped at $50,000, a figure reached long ago.

In the meantime the computer reinforcements are scanning requests for key words so that they can spit back replies like, "Don't hold your breath on that Cindy Crawford thing, how about something more realistic?"

But instead of almost instantaneous replies, letter writers have to wait up to 12 hours for an answer, Malamud said.

The recent surge in popularity of personal computers has sparked dozens of electronic services across the nation that answer Santa's e-mail. But Malamud says his is unique.

For one thing, with the proper equipment you can eavesdrop on the elves complaining about decking the halls until 2 a.m., and the reindeer's irritating bell-jingling.

"The elves are all surly and speak with a French accent," Malamud said.

And you can download a digitized photo of the White House Christmas tree and decorate it with electronic ornaments. One ornament is a replica of Socks, President Clinton's cat.

You get all this at Santa's web page by pointing to http://north.pole.org/ with the appropriate software.

E-mail addressed to Santa@north.pole.org still gets answered. But watch how you send it. Malamud is posting this message on computer bulletin board lists nationwide:

"On behalf of Mr. Claus and the elves, I'd like to say that mail bombs to Santa will result in immediate removal of your name from the 'good' list and a transfer to the 'bad' list. Sending lots of messages (one person sent 4,205) is bad behavior, no matter how good the reason may sound at first. Please help us squash this nasty rumor and allow us to get back to planning for Christmas. Thanks for your assistance in circulating this message to any/all lists that are carrying the original 'Spam Santa' message."

Art Bits

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VIA SATELLITE

USA TODAY

Life

THURSDAY, DECEMBER 1, 1994

Techno-tots are summoning Santa on-line

By Bruce Schwartz
USA TODAY

Kids, save your stamps: This year Santa's taking messages via cyberspace.

But if you're asking for lots of presents, it might help to buy a $5 "I e-mailed Santa" button from the old huckster.

Santa has answered e-mail in the past. But new sites, such as those on the Internet's World Wide Web, go further, letting visitors message Santa and shop for souvenirs.

To fortysomethings, impersonal e-mail to Santa may seem colder than the Pole on Dec. 26. But to their kids?

"Hey, its a different generation," says Paul Conti of WNYT, an Albany, N.Y., TV station offering a Santa e-mail site (santa@newslink13.com) on its news department's free public bulletin board. "Kids expect Santa to have a drop spot on the Internet." Others:

▶ Internet Access in Ottawa, Canada, responds to e-mail sent to santa@northpole.net; its Web site has messages from Santa and elves, North Pole weather — and $5 souvenir buttons. (http://northpole.net)

▶ The CityLink Web project, which links to information on dozens of U.S. cities, has a North Pole link. Included is a letter parents can copy and print out: *Dear (Child's Name), Have you been a good girl/boy?* Stop by the "virtual workshop" to buy clocks, Swiss army knives and scarves (http://www.neosoft.com/citylink).

▶ The most altruistic stop on the Web is http://north.pole.org. Listen to *Jingle Bells* and crabby elves; see the National Christmas Tree; jump to Web sites run by charities. Or e-mail santa@north.pole.org for a reply from the Big Guy himself.

Woman, 23, Stabbed, Seriously Wounded

2 Kids Strangled in B'klyn

Girl, 6, and Boy, 4, Found in Bed-Stuy Apartment / Page 7

SPORTS FINAL
New York Newsday
EDITION

FRIDAY, DEC. 24, 199[illegible] NTS

NATION/WORLD

A Byte Christmas

Don't look for Santa near the chimney — he's on the computer

By Joshua Quittner
STAFF WRITER

Santa Claus has come to the Net. Actually, three of them. Good little boys and girls with access to computers and the Internet, the global network of interconnected networks, can send electronic mail to him, er, them. That pool of prospective users includes anyone with access to the Prodigy, CompuServe, America Online, GEnie and Delphi on-line computer services.

And these Net Santas will respond.

Santa started on the Net five years ago, on MCImail, an electronic mail service that was among the first to attach to the Internet. You can still reach him there. He also has an address at santa@csgi.com. But the most recent address for Santa, one that turned up for the first time this year, and seems to be attracting a huge amount of mail, is this one: santa@north.pole.org.

"He's gotten well over 6,000 messages already, from all over the world," said Carl Malamud, helper for the north.pole.org Santa. Malamud, during the off season, is president of the Internet Multicasting Service, in Washington, D.C., which sends audio programing over the Net.

Malamud said the volume of e-mail ("I'm sitting here sorting through 800 messages that came in last night . . . ") is no problem for his bearded boss. The holiday hacker devised a high-tech way to pipe messages back to kids dreaming of a byte Christmas: The Santomatic Perl Script, a computer language that allows Santa's computer to automatically browse letters to him, look for requests and send back a customized reply.

The Wired Generation's most frequent request?

"Cindy Crawford," said Malamud, noting that more than 200 requests have come in so far for the supermodel. Not her picture, mind you, the model herself. "We had a whole sixth-grade class of boys ask that Cindy Crawford be sent to them."

The Santomatic Perl Script's response: "Don't hold your breath."

You can join in public radio's reinvention, on-line

Medium has new capabilities, but content is still paramount

By Carl Malamud

A few months ago, I started a new kind of radio station, one that uses computer networks and personal computers as the vehicle for sending streams of audio data around the world. This experiment in computer networks was dubbed "Internet Talk Radio" and featured plans for a single show: *Geek of the Week*. This little project soon grew out of control and now I find myself running the world's first cyber station.

Like anybody involved in a technical field such as computer networks, I found much of my time taken up with disseminating and digesting information. I wrote books and articles and read books and articles. I consumed a massive amount of digital data, ranging from electronic mail to bulletin board discussion groups to technical papers stored on-line in digital libraries.

The problem was, the data I was getting was not giving me the kind of information I needed. I wanted a general source of real information about my field and I wasn't getting it. If I wasn't getting what I wanted, it was a safe bet that my colleagues were not getting what they wanted, either.

What the computer field has been missing is a working press. We have lots of great in-depth professional reference works, but the magazines and newsletters for the field are a step below the usual standards for the trade press, combining fair-to-middling journalistic skills with little practical understanding of how to use a computer.

What I wanted was a decent magazine or other source of regular information to keep me up to date in my field. You know: a few technical articles, a few funny stories, a little gossip, some editorials, all mixed together in a way that I could look forward to a dependable, real source of information. In short, the kind of thing you read with your morning coffee or on the train to work.

At first, I thought I'd start my own magazine. Magazines cost money, though. You pay lots to print and mail the magazine, and to verify the circulation for advertisers.

I decided it was time to start using the tools that I've been teaching others how to use. For the last two years, I've been studying the global Internet computer network, a network of networks that reaches 20 million people in 140 countries, a network that is growing at the historically unprecedented rate of 20 percent per month. The Internet *is* the global village, the web of connectivity that will soon reach every computer in the world.

While there are several on-line newsletters on the Internet, it occurred to me to play with a different kind of data. Two factors made multimedia publication—supplementing text with audio, video and other data types—practical and possible. The Internet infrastructure has expanded to the point where several million people have gone beyond the initial connectivity of a dial-up telephone line and a modem and now have permanent, high-speed connections into the Internet. At the same time, computers have matured to the point where several million people have computers with sufficient storage capacity to hold multimedia data and the hardware to play high-fidelity sound.

With multimedia starting to spread throughout the Internet, it seemed like it shouldn't be too hard to go to a conference of engineers with a microphone and a digital audio tape (DAT) deck and sit down to tape a series of interviews. The idea for *Geek of the Week* was born, and I decided the idea had enough merit to justify spending a few hours a week on it. A sort of hobby, if you will.

The hobby turned into a full-time occupation. I quickly realized that I wanted to have high-quality data: professional programming and professional production. I called a friend who worked his way through law school playing in bands and persuaded him to spend part of his time composing music for me. I invested in digital effects processors, digital interfaces for computers, professional microphones and a variety of other fancy new toys.

Our listeners show us new ways to play the files. One spools the sound into his company voice-mail system, letting his listeners dial up "Geek of the Week" or the Dalai Lama on their speakerphones. Several copy the data onto their Macintosh Powerbooks and play the radio on their drive home.

Carl Malamud does field research for his international odyssey, Exploring the Internet *(Prentice-Hall, 1993). The engineer/writer is president of the Internet Multicasting Service. Malamud can be reached at carl@radio.com on the Internet.*

Next thing we knew, we had a radio station. *Geek of the Week* was in production and we were negotiating with the National Press Club for permission to rebroadcast their luncheons. Granted, the club was a bit perplexed as to what we were doing, but it sounded kind of futuristic and after all, I was a member of the press. Sort of. A radio station was being born, but nobody quite believed this was real.

Then, for some strange reason, the *New York Times* decided this was front-page material. My phone started ringing and ringing and ringing. The National Press Club decided we were legitimate. *Geek of the Week* was joined by *TechNation*. The initial two underwriters, Sun Microsystems and O'Reilly & Associates, were convinced they had invested wisely and exercised their options for a year's worth of shows.

We soon found ourself in an office in the National Press Building, ensconced between the Washington bureaus of publications from such exotic locales as Korea and Kansas. Two of our sponsors—MFS Datanet and UUNET Technologies—helped us pull fiber optic into the office and into the National Press Club, establishing a 10-million-bit-per-second link into the Internet, the fastest link in Washington, D.C. The link was so fast, in fact, that the White House borrowed it when they needed to put the Rose Garden on-line for a demonstration for the President.

The basic operation is actually quite simple. We produce shows like any production studio, mixing our own material or transferring other people's shows onto a local master. Our masters uses the same format as DAT or CDs: 48 kilohertz sound files, suitable for professional production. Instead of putting our masters on a DAT, however, we keep them on a computer.

These digital files have 48,000 samples per second, with each sample taking 16 bits of data. That means that an hour of audio, mixed down to mono, takes 330 megabytes. Computers are powerful today, but moving around 330 megabyte files is a bit much, even for high-end workstations.

To make the data more manageable, we resample the files down to 8,000 samples per second using a standard known as Pulse Code Modulation (PCM)—about the same quality as a radio station gets when it installs a dedicated, balanced, telephone line for a remote feed. Not exactly ideal for Mahler or Wagner, but fine for most radio work.

We then put the completed program on the Internet. Each program is one or more audio files, accompanied by a "read-me" file of text describing the program (equivalent to the DACS system in public radio). Through our informal distribution mechanism, major networks automatically grab the files from the first distribution point, making copies of the data available at convenient locations around the world. No fancy distribution system ((e.g., no lawyers and no contracts) needs to be established: the Internet is remarkable in its ability to dynamically establish distribution trees for important data.

Corporate and campus networks and end users go to the various regional and organizational distribution points and transfer the files onto their local networks. The files are played using the standard sound tools available on any modern Macintosh, NeXT, PC or other computer. We don't distribute any software; our only product is data that can be played as the user sees fit.

We impose no copy restrictions on the data. The strategy is to get the widest possible listenership, then sell the demographics back to the underwriters. Using statistical techniques, we've estimated our listenership at 100,000 people in 30 countries. We can't measure our listenership exactly, but we like to say that our estimates are at least as accurate as the Nielsen ratings for television.

Because there are no copy restrictions and no special software, our listeners end up showing us new ways to play the files. Many networks run local "radio stations," broadcasting the data onto their network and letting users tune in. One network manager spools the sound into his company voice-mail system, letting his listeners dial up *Geek of the Week* or the Dalai Lama on their speakerphones. We've had several radio stations copy our data off the network and put the program back on the air. Several people actually copy the data onto their Macintosh Powerbooks and play the radio on their drive home.

Radio is, at first glance, what we do. We syndicate shows from public broadcasting such as *TechNation, Soundprint* and specials such as Pacific Multimedia's classic eight-part *Hell's Bells: A Radio History of the Telephone*. We produce our own *Geek of the Week*. We join NPR and C-SPAN in covering the National Press Club luncheons.

We call this radio, but that's a metaphor for what we're doing. This is a different beast from radio, one in which sound and video and images and text can all coexist easily. This is a medium where you can put the "radio" on pause when a phone call comes in, radio where you can talk back to the set and, the host willing, have your questions sent back out over the air.

I picked radio as a metaphor after looking carefully at the current capabilities of the Internet and after looking carefully at the history of our communications media in the past. We often borrow an older metaphor when we start anew: television started out as radio with pictures, and the telephone started as a telegraph you can hear.

Over time, we adapt to the unique characteristics of the medium we inhabit. The radio station becomes a cyber station and the similarity to radio goes away as we adapt to the realities of a new medium based on a global network of computers.

If public radio ignores the remarkable convergence of media that is occurring, it will relegate itself to history. Actively working with the new technology will be the key. There is a role, but it must be found based on real experience with the technology. You can't do this from the sidelines.

Is there a role for public broadcasting in this world? Yes! There is room for the announcers and the engineers and the producers and the stations. There is definitely room for the networks. But, there is no room for those who program with the past, who insist that they have an immutable format that cannot change. If public radio ignores the remarkable convergence of media that is occurring, it will relegate itself to history. Actively working with the new technology will be the key if public broadcasting is to adapt. There is a role, but that role must be found based on real experience with the technology. You can't do this from the sidelines.

In broadcasting, indeed in any medium, while the distribution media and the data types are defining characteristics, what is paramount is the flow of content. Public radio is not about audio data sent out over a satellite system, public radio is about *All Things Considered* and Terry Gross and *TechNation* and Garrison Keillor.

Public broadcasting has evolved to become a mix of local programming, national feeds from NPR and APR and PBS, and feeds from independent producers using the public broadcasting satellite systems. All of these sources of data are mixed together and sequenced to form what we know as the "station."

What makes NPR and APR and PBS special? What makes your local station special? It is not airwaves or big antennas, it is not spectrum allocation or digital encoding formats. What gives public broadcasting its identity is the organized distribution of information. What do we talk about? How is the information presented? How, over time, do we come to depend on one data stream over another for a certain flavor, a certain feel?

Who you are talking to and what you are saying are what define public broadcasting. The fact that the data on a radio station are all audio and that a satellite system is used are irrelevant in the long run, no more significant than the fact that record players in your station are being replaced by CDs. CDs did not spell the end of radio and neither will computers.

There are many things that a station today can do to ease itself into the global village. First and foremost is to get electronic mail. This can be as simple as

Continued on next page

PTR

Indies not discouraged

To the editors:

In his report on the Coalition vs. PBS Censorship's recent open meeting with PBS programming head Jennifer Lawson [*Current*, Oct. 4], Jack Robertiello surprisingly misreads the impact of Ms. Lawson's performance on the meeting participants.

Far from "wearing us out" with her "calm" but "discouraging" presentation, Ms. Lawson energized most of us to begin actively campaigning against programming censorship at PBS. In fact, a group of us met immediately after the meeting to begin work. This was a direct and immediate result of her presentation. While we were looking for a little honesty about the financial and political constraints under which she operates, what we got was an astounding amount of often disingenuous bureaucratic "doublespeak," incensing everyone there.

Notably, when questions were raised about PBS's increasing reliance on corporate underwriting, all we heard were denials that corporate support was a significant influencing factor at PBS. "I don't have any group that I feel beholden to," she insisted. Yet less than a week later, she gave a different impression to the *Hollywood Reporter*. In referring to possible erosion of corporate support due to the blurring of public television's identity with cable, she was quoted as saying, "I'm not so much worried about that as I am about corporate changes at places like General Motors and IBM."

Contrary to the impression in your article, this meeting was not about the dashed hopes and dreams of a group of whimpering, albeit award-winning filmmakers. Ms. Lawson's ostensibly sincere admission that PBS was not interested in more programming from independent producers, or as she put it, "making life easier for the people in this room" which your article highlighted as the discouraging blow of the meeting, entirely misses the point.

Those who attended this meeting represented a large segment of the American public who believe that our democratic society suffers when PBS no longer fulfills or even cares about its congressionally mandated mission; a mission to carry diverse and innovative programming, free from the commercial concerns that dictate programming on the networks. In discharging this responsibility, PBS is supposed to accept a significant portion of its programming from independent producers, something Ms. Lawson seems completely unmindful of.

As we mentioned in our follow-up letter to Ms. Lawson, had she given any more than lip service to the myriad concerns about censorship and bias raised at the meeting, those in this room could have begun mobilizing millions of Americans to help defend PBS and CPB against its corporate-funded conservative attackers. But based on her responses and attitude, we just saw no point.

On the other hand, a highly charged and politically sophisticated group, the Coalition vs. PBS Censorship, has now formed as a result of meetings with Ms. Lawson on both coasts, dedicated to helping expose the impact of corporate dependency and the complete lack of public accountability at PBS. This spring, the coalition will be sponsoring the "Banned by PBS Film Festival" in Los Angeles, which will then travel around the country.

Mr. Robertiello may think Ms. Lawson emerged from this meeting "without a mark." But we suspect that she and others at PBS might disagree.

Joanne Doroshow
Mark Morl
Co-spokespersons, Coalition vs. PBS Censorship
New York City

Don't dismiss this tool

To the editors:

Those of us in noncommercial radio who bought the second and third years of the Modal Music Study (which grew out of the Denver Project [at KCFR]) are—to the best of my knowledge—quite happy with the results.

Those few stations who were willing to pay to get information about the preferences of a classical music audience that also listens to NPR news now have a powerful tool in their continuous effort to build a significant and loyal audience for classical music and news. We should explore it together instead of fighting over whether we should have opened the door at all.

I am puzzled by the venomous attitude taken toward this music study by some people in the noncommercial radio community [*Current*, Sept. 6]. I fail to understand why any professional broadcaster would actively refuse to understand a careful study of the very audience they may be trying to serve. It also seems rather presumptuous to criticize a study you have never read. If you purchased the study and analyzed its findings carefully, then you are more qualified to comment and criticize. Steve Coghill's articles in *Music Notes* were informative, but they do not tell the whole story.

Modal Music is a powerful tool. Nothing less and nothing more. It can be used effectively or poorly. Some of the brightest people in noncommercial radio research were involved in its design and execution. It is not a "foolish thing." Stations that air classical music and NPR news programs and that want to build programming with similar appeals may find Modal Music a mandatory thing.

It is important to emphasize that the group of people the study tested were classical listeners who sampled NPR news, not necessarily primarily NPR news listeners. For that reason alone, Modal Music could well be useful even to all-classical stations.

Finally, to those who, with incomplete understanding, claim that Modal Music dictates programming that is bland and shallow, let me say that my own passion for and knowledge of music of all kinds—and especially classical—match anyone's. Only my passion to be the best broadcaster possible exceeds my passion for music.

Further, as the person most directly responsible for the evolution of WKSU's playlists, I can tell you that they are very far from bland and shallow. To steal a phrase from Murray Horwitz, "the shock of the new" is as important to us as to anyone, maybe more than to most. We simply look for those new and different things that will please and delight our listeners, instead of making them flee to another station.

Charles Andrews
Music Coordinator, WKSU-FM
Kent, Ohio

Keeping opera alive

To the editors:

I'm concerned that public radio stations are willing to cancel the live Metropolitan Opera broadcasts without considering the consequences [*Current*, Sept. 20]. I'm not talking about the consequences for [Wisconsin Public Radio], because the station will do fine financially after this furor dies down, as long as losing some opera lovers is offset by a net increase in ratings and dollars.

My concern is for the consequences to opera as a living, contemporary art form. Whether public radio stations know it or even care, they play a vital role in keeping opera alive in their communities. Public radio stations may in their quest for ratings destroy something beautiful.

My limited research shows that broadcasting opera in the evening results in substantially lower opera listenership. This means less service to opera lovers, fewer new opera lovers created and eventually lower attendance for local opera companies. Furthermore, it means abandoning the responsibility to expose other listeners to anything more than the same old thing, over and over again.

Is it reasonable to expect Texaco to continue underwriting the Met broadcasts in order to reach substantially fewer listeners and serve opera lovers less well? If public radio stations are unwilling to accept opera broadcasts free of charge on Saturday, it's hard to believe they would then pay for the *NPR World of Opera* and broadcast it in a low-listening time period. This would essentially be the end of contemporary opera performances on radio and would inflict serious damage on opera as a living art form.

When service and ratings are treated as synonymous, then public radio is operating according to commercial principles, and the results are the same: homogenization. The majority gets ever more, and the minority gets ever less.

Helen Schmodeman
Co-secretary, Save the Met Live Broadcast
Madison, Wis.

Internet radio

Continued from previous page

calling up CompuServe or MCI Mail or the dozens of other commercial providers and getting an account, or it can be a bit more adventurous by signing up with Internet service providers.

Electronic mail is the entry point, it is the line that differentiates those that try from those that don't. If you don't have electronic mail, you can't communicate. Electronic mail can cost less than $10 per month, the modem costs $200 or less. There is no excuse not to have electronic mail: tens of millions of people around the world use electronic mail on a daily basis. If you work with information, this is a tool you need to have.

What do you do with your electronic mail? At first, you simply send messages to your colleagues. You would be shocked at how many of your colleagues are already on-line. You can quickly join a world where people actually write to each other on a regular basis.

Next, you sign up for mailing lists. You can join forums that discuss the future of radio or the future of film or the future of Asian cuisine. You can join forums that look at digital libraries or discuss how to use your Macintosh or the merits of Australian rugby.

Electronic mail is not some mere hobby, it can become an integral part of your work in broadcasting. If you are producing a show, include the electronic mail address in the ending credits. You'll be amazed to see how many comments you get back from your listeners: people will dash you off a little bit of e-mail but are much less likely to write you a formal letter.

E-mail can be used as an important tool for the talk show host. When we hooked Ira Flatow's Friday edition of *Talk of the Nation* to the Internet, we got hundreds of

It is not my cyber station versus your radio station; it is us versus "Married with Children."

listeners sending their comments and questions in. When was the last time you had 300 of your listeners write you a letter in one hour?

Getting hundreds of letters doesn't mean that you'll read them all on the air or even respond. It does mean that your listeners have an opportunity to interact with you. They become part of the show. More importantly, you now have the opportunity to choose which questions you want to address on the air. If you have a talk show, your path to the listeners is a telephone line. If you're a traditional talk show, you have a half-dozen or so lines. How many potential questions can you possibly get in an hour over a telephone line? Perhaps a dozen by the time you've screened each call and queued it up.

The worst problem with a telephone line is that you're getting the wrong comments. Think about it. You have only a few lines. Who gets through? The guy with nothing better to do than to continually hit the redial button. Is this the listener you want on the air?

With electronic mail, a single phone line can be used to bring in hundreds of messages. Park an intern on a laptop computer with a modem and you can get a vast number of potential questions. Ask people to include a phone number and call them back if the question looks interesting, or simply read the message on the air.

Once you get on the network, you'll quickly move beyond e-mail. You'll find that you can communicate with an important part of your listener base, particularly if your station is based around a university campus. Almost all students at major universities have access to the Internet. You can post your schedule on the network. People can pledge on the network. You can run a discussion group around topics that you feature on programs.

What's the next step? Your listenership is currently bounded by the precious spectrum that the government granted you. Your transmitter's reach restricts how many people will listen (and pledge).

What if your station could reach around the world? It really isn't difficult! Publish your programs as audio files on the network and put them on a server. If you feel your station is unique (and who doesn't?), you can send that unique information around the world.

You can use the network to distribute to other stations as well. Tired of upload fees? Can't get satellite time? Miss that last cycle? Use the network instead. The point is that there are rich and varied ways stations for to use the Internet—which supplement your current operation, not replace it.

Will radio or TV become irrelevant in this brave new world? You might as well ask if the book will go away.

My friend Brewster Kahle invented a digital library system called WAIS that now consists of hundreds of different databases in a dozen countries. WAIS has a remarkable collection of information, ranging from the collected works of Shakespeare to the text of the Koran to collections of satellite photos showing the weather.

Do you know what Brewster values the most? His old printing press and his antique books. The question to him is not the book versus the computer, it is literacy versus illiteracy. Likewise, it is not my cyber station versus your radio station: it is us versus *Married with Children* and *Roseanne*. The important thing is not the particular format, it is the information, its presentation, the format and the aesthetics. It is not the book and radio that are the enemies, it is illiteracy. ■

terface (ODI) client, multiple protocols soon will be able to run simultaneously over a PPP link, such as IPX and LWP IP. This represents major new functionality. When you dial in, you should be able to run as many network protocols as you need, simultaneously if necessary. Servers just need to start routing more protocols to support dial-ins from NetWare IPX, LAN Manager, Windows for Workgroups, NetBEUI, VINES IP and, of course, TCP/IP and AppleTalk.

This works because the PPP architecture handles support for multiple network protocols. For each network protocol, a PPP data link driver needs a corresponding Network Control Program (NCP) implementation. AppleTalk already has an IETF-standard NCP called ATCP (RFC 1378). A similar standard NCP has been defined for TCP/IP (IPCP, RFC #1332). Standards for PC-oriented protocols are also defined or in the works.

Unfortunately, Apple didn't announce any specific product plans or delivery dates.

With this announcement, we assume Apple and Shiva plan to offer a PPP data link driver and the ATCP NCP protocol adapter for the Macintosh client. We also figure the new ARA will work as easily and transparently as the current implementation. We hope it does not require a set of modem scripts in addition to the current ARA and Macintosh Communications Toolbox implementations. We also hope they'll include an IPCP implementation for the Macintosh that will allow Apple's own MacTCP to run over PPP. Third-party solutions are already available that let MacTCP use PPP—for example, the public-domain MacPPP utility—but these don't have anything to do with getting AppleTalk to run over PPP. We'd also like Novell to supply an IPXCP for its new MacIPX stack. Apple's Open Systems Interconnection (OSI) products certainly could use a remote access solution as well.

On the server side, with the promise of Mac ARA PPP clients dialing in, server products will have to support ATCP NCP and route or bridge AppleTalk too. If we have Macintosh software that supports PPP dialing, we need servers that can answer the phone, speak PPP and then run AppleTalk over that pipe. The companies did not say whether Apple will start providing multiport ARA PPP servers, but partner Shiva certainly will.

Apple's finally setting its sights on the enterprise networking target for remote access solutions. This will serve to motivate the many vendors struggling to get their PPP server solutions working —all those Powerbooks out there need to call home every once in a while.

The Internet Goes to the Head of the Class

by Linda Nicastro

Fifth- through eighth-graders from schools in the United States and England recently held an Internet-based videoconference to sum up their collaborative on-line study of the environment. It looks to us like the kind of project for which we should use the emerging National Information Infrastructure (NII).

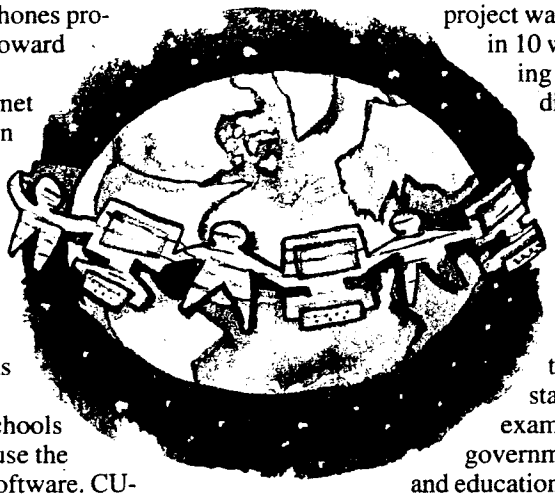
During a six-week curriculum, the students read Vice President Al Gore's book, *Earth in the Balance*, and studied groundwater pollution and its source in their communities. The groups, at schools in Arlington, Va.; Knoxville, Tenn.; Oceanside, Calif.; and several English schools coordinated from Hampton, England, did traditional library research and took outdoor field trips to gather water samples and record videos. In addition to videoconferencing, the students used the Internet to investigate databases and exchange research findings via electronic mail.

The highlight of the project was the videoconference, however, when the students compared their research and videos on groundwater pollution and had a chance to ask questions of officials in attendance, including representatives from the White House Office of Science and Technology Policy, the directors of the National

Science Foundation (NSF) and a NASA scientist. Carl Malamud, principal of the Internet Multicasting Service and founder of Internet Talk Radio, served as project coordinator and conference moderator.

The project was the first activity of the Global Schoolhouse, an ongoing collaborative learning venture supported by the NSF and 30 other organizations that have made long-term loans and donations of equipment and services. Organizers hope future Global Schoolhouse activities, such as teacher training and an online science fair, will involve children from additional schools and countries. Projects like the Global Schoolhouse are important because they "put the technology into the hands of the people you need to empower... the teacher in the classroom," says Don Mitchell, an NSF staff associate.

A combination of T1 and Switched Multimegabit Data Service (SMDS) lines were put in place by Sprint, Bell Atlantic, Southern Bell and Pacific Bell. Routers from Cisco Systems linked the schools' local networks to the Internet. Sun Microsystems SPARCstations served as reflectors, taking video images from one site and sending them to other sites. Macintosh Quadra 700 computers provided by Apple Computer were equipped with TeleCamera video cameras from Howard Enterprises and ran Cornell University's CU-SeeMe videoconferencing software. Audio was carried separately through high-end speaker telephones provided by J. Howard Associates.



With Internet connections in place and Macintosh computers equipped with MacTCP, Quicktime, video cameras and video boards, the schools were able to use the CU-SeeMe software. CU-SeeMe enabled the students to receive small, black-and-white video images of each site in windows on their Macintosh screens. Cornell's software, still under development, is available publicly at no cost.

"The technology is rather crude by TV standards. It gets close to TV quality at good times, but with a bunch of feeds and activities on the screen, the frame rate drops. But nobody cared. They were so pleased with it," says NSF program officer David Staudt.

"This will take off on its own merits and be accepted in the education community," he adds.

The water pollution study project was put together in 10 weeks, including donation, distribution and linking of the technology to make the videoconference possible. The project therefore stands as a good example of how government, industry and education can cooperate. We hope to see more of this sort of collaboration in the future.

Contact the NSF to learn more about the Global School Project or to donate time, equipment and services: National Science Foundation, Division of Networking and Communications Research and Infrastructure, 1800 G St. NW, Washington, D.C. 20550; (202) 357-9717, fax (202) 357-5865, Internet: gsh-info@internic.net. ■

Students Rave About Internet Experience

We asked students who participated in the Global Schoolhouse project to evaluate it. Here are excerpts from their e-mail responses:

"I found it really exciting to participate in the Global Schoolhouse project because talking to people on the other side of the world about problems that affect us all is really cool. The problems of river pollution are serious. The more we can compare results and experiences and put that information into use, the better it will be for our rivers."

—Sarah Robb, age 13, grade 8, Orleans Park Secondary School, London, England

"I enjoyed working on the Global Schoolhouse project because I got to learn more about computers. I also had the chance to meet people from all around the world. If I had the chance to do this again, I would love to!"

—Alexi Charles, age 10, grade 5, Long Branch Elementary School, Arlington, Va.

"This has been a very good learning experience. I have learned what exactly is happening to our environment and what I can do to help. If this becomes available to all schools, we will have a very powerful tool to combat environmental problems. I hope all students will be able to have the learning experience that I did."

—Jeromy Henry, age 13, grade 7, Jefferson Junior High School, Oceanside, Calif.

—L.N.

THE PUBLIC TELECOMMUNICATIONS NEWSPAPER

Current

Flatow's talk show marks a digital first

Multitudes tune in their computers; guest transmits radio via Internet

By Steve Behrens

The other day, in yet another sudden demonstration of media convergence, thousands of people apparently listened to NPR's *Talk of the Nation* on their computers.

Ira Flatow, host of the Friday science edition of the talk show, knows there were lots of computer listeners because some 400 of them queued up to talk back to him—through microphones attached to their computers—and hundreds of others sent text messages by electronic mail (address: IRA@RADIO.COM).

It was a first for live two-way talk radio, said Carl Malamud, founder of a one-man computer radio network, who was Flatow's guest May 21. "In terms of hooking up the land of the radio to the land of the computer network, it's the first time it's ever been done," he claimed.

The show not only went out over NPR but also through Internet, the computer world's international "network of networks."

Hackers, scholars, librarians and others called in from California, Sweden, Wisconsin and elsewhere to testify that computer networking had enriched their lives. So many called, in fact, that Flatow believes parts of the Internet were clogged, causing callers' voices to break up intermittently.

Listening to radio over your $10,000 computer may be somewhat impractical, Flatow says, but the experiment illustrated how an enormous special-interest audience can be assembled on short notice through the existing Internet infostructure.

Wants to join NPR

Malamud not only has incorporated his radio network—Internet Multicasting Corp.—but is seeking nonprofit status and

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Internet radio

Continued from page 1

admits a desire to become "a public telecommunications entity" and an NPR affiliate.

Since it signed on March 31, the network has begun distributing:

- Malamud's own talk show, *Geek of the Week*, in which he interviews computer experts on hyperadvanced topics (Microsoft whiz-plutocrat Bill Gates "doesn't know enough" to be a guest),
- the independently produced public radio show *TechNation* (which brought Malamud to the Public Radio Conference earlier this month),
- the National Press Club luncheon speeches (via a high-speed digital line he had put into the press club building in Washington), and
- *Internet Town Hall*, which has featured such events as a visit with the Dalai Lama and a hearing about multimedia held by the House telecommunications subcommittee.

Malamud estimates that *Geek of the Week* has a 100,000 listeners, judging from indirect evidence (no Arbitrons are available), and he relies on corporate underwriters like Sun Microsystems to cover costs. (The federal backbone of Internet has anticommercial rules, but Malamud says National Science Foundation and NASA officials have cleared his underwriting blurbs.)

The network founder is a networking architect and technical writer—he has written seven computer books, including *Exploring the Internet* (PTR Prentice Hall, 1992)—who was disappointed in the quality of the computer trade press and wanted to start his own publication.

Startup and printing costs were too high for a paper magazine, however. And he wouldn't be doing a favor to computer folks if he gave them a new on-line text newsletter because they're already swamped with e-mail messages.

Listening to radio over your $10,000 computer may be somewhat impractical, Flatow says, but the experiment illustrated how an enormous special-interest audience can be assembled on short notice through the existing Internet infostructure.

So Malamud decided to do live radio over the network, and added audio gear to his home office in Alexandria, Va. "For under $100,000 I was able to put together a radio station that reaches 26 different countries on the day that it goes on the air," he said on *TechNation*. "Anybody can be a radio station."

Just don't touch the ads

"Desktop broadcasting," as Malamud calls it, gives small organizations enormous reach. One reason he can afford to start an international network on his own is that the infostructure already exists, and most of the transmission costs come out of somebody else's pocket. He simply transmits his half-hour program in a 15-megabyte audio file to a major network node nearby in the Virginia suburbs of Washington, D.C. Operators of networks in Europe, Japan and elsewhere pick it up from there. People who want to hear Malamud's programs seek them out electronically at the nearest network node, and the service bill goes to their employers, which often benefit from federal network subsidies.

One fan breaks up the program into audio tidbits and puts it on his company's voice mail system. And some intermediaries do other listeners a favor, squeezing down the volume of data by running it through their equipment to reduce the digital audio sampling rate.

Malamud doesn't mind when people edit or rearrange his shows downstream, he said in an interview on *TechNation*. "The only thing I don't let you do is take out my ads and put yours in."

Not every computer user could receive and talk back to talk radio, of course. You need sound equipment and a modem or a digital network line connected to your computer. And lowly computer users with ordinary 2400 bits-per-second modems can't listen live; they have to capture the shows on disc for later playback, because it will take 12 hours to get the half-hour program through their modems.

But listeners who have broadband connections with Internet capable of carrying 64,000 bits per second can pull in Malamud's shows live.

Malamud predicts that when computer networks generally reach that capacity and today's electronic "two-lane roads" become the "information superhighways" that Vice President Gore is touting, audio and video and other multimedia usage of the networks will explode.

Though this month's *Talk of the Nation* broadcast was a first for a two-way talk show, Flatow says his show had gone out by Internet at least once before, last year, though it was a one-way connection.

He didn't know people were listening on their computers until someone phoned to ask: "Did you know you were on the Internet in Europe?" Whereupon Flatow recalls that he (like any good broadcaster) immediately inquired, "Where did you get the rights?" ■

LEO systems will operate below 1 GHz and carry only brief digital messages [see "Data Communications," p. 26]) will ultimately cover the world continuously. Satellite operators will have to obtain government permissions to sell service to each country, typically through local affiliates. Competing with these U.S. systems will be London's International Maritime Satellite Organization. Better known as Inmarsat, it will form a British affiliate company to set up a $2.6 billion Big LEO system of 10 satellites.

The Spaceway system, from GM Hughes Electronics in Los Angeles, is to offer all-digital voice, data, and video services directly to U.S. residents, beginning in 1997. Its geostationary 48-beam satellites would feed terminals having ultrasmall apertures 660 cm across. Subscribers would receive telecommuting, telemedicine, digital libraries, and other high-bandwidth services at data rates of 16 kb/s to 1.544 Mb/s.

Wireless auctions

The FCC announced a new Wireless Telecommunications Bureau. This reflects the convergence of wireless services from two categories: public, including cellular telephone and paging, and private, including so-called two-way radio services originally intended for organizations' internal use but now addressing the general public as well.

Thanks especially to the progress made by upstart vendors with new technologies and to the inclination of Congress to treat similar wireless applications similarly, the distinctions between these two categories, public and private, diminished in 1994. Now the FCC will determine if

Viewpoint: An airline-style price war looms in telecommunications

CARL MALAMUD

Telecommunications is about to go through the same revolution as the computer industry did, and the speed of its fundamental transformation will likely catch traditional suppliers in the field unawares.

Several years ago in the computer industry—after long hearing about such visions of the future as supercomputers on the desktop—suddenly the future happened. PCs became so powerful that they made the mainframe almost irrelevant.

This revolution caught mainframe makers by surprise, giving those once-proud corporations the opportunity of deciding which divisions to sell off in order to remain solvent. Today, Digital Equipment Corp. is little more than a PC mail-order company, and IBM Corp. tries to squeeze increasing blood from mainframe turnips.

Key to the computer revolution was the PC's personal aspect. A powerful computer became usable by ordinary individuals. In telecommunications, the same thing is about to happen, and for the same reason: powerful personal computers.

What proof? The Internet now reaches more than 30 million people in 159 countries. Unlike individual networks such as CompuServe or America Online, the Internet is a fundamental infrastructure connecting the world's networks. With a growth rate of 15–20 percent a month, the day is coming when every computer in the world will be linked to this mesh.

Such wholesale connectivity is transforming the demand for raw communications capacity. In a typical home, a telephone is used for voice calls for an hour or so. What happens when the computer goes online? The demand goes from 1 hour to 24 hours and from a single voice channel to (if we could get it) a T1 line operating at 1.544 Gb/s, 23 times faster. That's more than a 400-fold increase.

Telecommunications companies like to fancy themselves as "value-added providers of information." The truth, however, is that to survive in the new world, they must shed notions of providing information and must measure themselves by a single metric: dollars per bit per second. They are no different than electrical, water, sewer, or any other utility competing for the right to push stuff through a pipe.

'Because of PCs and multimedia services..., the demand for telecommunications capacity is going up by a factor of 400.'

Historically, large telecommunications companies have distinguished themselves in three ways: by large investments in capacity, by a sophisticated control network, and by customer service. All three of these defining factors are being assaulted by a world of interconnected computers.

The capacity to bring bits to the home or across the country requires a huge fixed investment. Both the long-haul and local telephone carriers have invested in capacity. But cable television companies have also invested in bringing a coax infrastructure into the home. Electrical companies are beginning to use their wires for communication and control as well.

The new reality is simple: there is so much capacity and competition that telecommunications providers are about to go into an airline-style price war to keep market share. If the phone companies don't lower their prices, then the cable-TV or electrical companies will undercut them to sell bandwidth.

What about the big telephone companies' vaunted control and routing networks? Yes, they have wonderful switching networks—but they are no longer alone. It is in control and routing that the PC revolution has hit really hard. The capability of million-dollar central office switches is now available on the desktop as a router from companies such as Cisco, Proteon, and Wellfleet. Any small business can now be a small phone company.

So what does that leave? Customer service is the only remaining way that a telecommunications company might distinguish itself from some other bits-to-the-home provider. But customer service is just a perk, like a frequent-flier club: if the service costs more than a competitor's does, people will still go to the one that's cheaper.

Because of PCs and the multimedia services available through the Internet, the demand for telecommunications capacity is going up by a factor of 400. To get that increase in demand (and to avoid bankruptcy), companies in this business have to start thinking strictly in terms of dollars per bit per second. How cheap will it get? How does $30 a month for a T1 line grab you?

Carl Malamud is the author of seven professional reference books about computer networks and is the founder of the Internet Multicasting Service, a nonprofit group that operates the first radio station on the global Internet computer network.

Washington Post; April 29, 1993; Pg. A4

'Global Schoolhouse' Links Youths Via Video

By John Burgess
Washington Post Staff Writer

Ozone, acid rain, last month's oil spill into a Potomac River tributary. Fifth-graders at an Arlington school had a face-to-face discussion on those weighty subjects yesterday with students from Tennessee, California and England. And the students didn't have to leave their classrooms.

They met electronically in an international video conference, their faces appearing on Macintosh computer screens, their voices emanating from telephone speakers. The Global Schoolhouse, the system's creators call it.

The hourlong session was a carefully staged and scripted demonstration, too expensive for the average school to afford and too complex to operate. And the video was primitive—black and white and jerky.

But the National Science Foundation, which sponsored the demonstration, contends that links like this will improve, drop in price and become common at schools if the nation presses forward with plans to build high-capacity data circuits known as "information highways."

"This is the kind of technology we'll see in every home and office in just a few years," said Michael Nelson, an aide to Vice President Albert Gore Jr. Gore has promoted the concept since his days in the Senate.

Yesterday, the children in London aired fuzzy video clips of themselves gathering water for acidity tests. Children in Tennessee briefed the others on field trips to rivers in the Tennessee Valley.

The Arlington children, students at Long Branch Elementary School, told the others of the accident that dumped 400,000 gallons of diesel fuel into Sugarland Run.

Arlington children who took part in the video conference gave it top marks as an educational tool. "People appear out of the blue and you get to know them," said Isabel Mueller, 10. Richie Robinson, 11, noted that the link allowed Long Branch to learn easily of work done by children at three other schools.

With White House and federal agency officials looking on approvingly, the children reveled in their time in the spotlight. They offered mixed opinions as to what would happen if the links became standard equipment.

One girl suggested that students would lose their excitement. Alexi Charles, 10, disagreed. "Different places do different things," she said. "You could compare and contrast."

Improved education is a prime benefit being promised by proponents of the information highway concept. But yesterday's demonstration, carried on a global network known as Internet, underlined some of the difficulties.

Computer companies and outside groups had to lend thousands of dollars of equipment. Outside technicians had to set up the project. And even then, there were glitches.

A screen went blank temporarily midway through the demonstration, leading project coordinator Carl Malamud to quip, "We're not getting video from London—we're proving that this is a real network."

Even if problems of money and technology are overcome, integrating the services into a school curriculum could prove difficult.

The Cutting Edge

COMPUTING/TECHNOLOGY/INNOVATION

The Voice of the Traffic Reporter on the Information Highway

By JAMES WEISSMAN
SPECIAL TO THE TIMES

What Magellan was at sea, what Roald Amundsen was to Antarctica, what Chuck Yeager was to the sound barrier, Carl Malamud is to the Internet.

Granted, pushing out the envelope of cyberspace is a little less treacherous than reaching the South Pole by dog sled, but in his own way, Malamud is no less intrepid an explorer. Among his innovations: He was the first to broadcast a radio program via the Internet, he was the driving force behind the project to bring Securities and Exchange Commission filings to the Internet, and he was the developer of "an experiment in remote printing" that lets you send a fax halfway around the world—free—simply by sending electronic mail to a special address.

Malamud, who refers to his nonprofit Internet Multicasting Service as a "cyberstation," is also a respected consultant and computer networking guru. We caught up with him in Las Vegas at the recent InterOp trade show.

Q What are you doing here in Las Vegas?

A Well, we run the first radio station on the Internet. We send audio out. This isn't newspaper, this is people sitting in front of their computers and listening. People listen on any personal computer that has multimedia capability, so that's any Macintosh or any PC with a sound card or any high-end workstation. They listen to national press club luncheons, they listen to famous poets reading their own work. We do original programs—for example, I'm the host of "Geek of the Week," a very technical interview show.

Q Isn't "Geek of the Week" available on cassette in bookstores? Why would anyone want it on their computer?

A Well, you have to go to the store and get it, whereas you've already got your computer on your desk. We're not going to replace audiotapes and we're not going to replace $10 radios. On the other hand, our programming stays around forever. You can listen to it whenever you want. You can stop it when a phone call comes in. You can pull the piece out that you like and ignore the rest. And so in that sense it is a new medium, and there are occasions in which it makes the most sense to actually listen to something on your computer.

Q I tried to download one of your radio shows.

Q&A

MARK WILSON / For The Times

Carl Malamud

Title: President, Internet Multicasting Service

Age: 35

Education: Indiana University; bachelor's in economics and MBA

Interests: Reading, music, cooking. His recipe for durian cheesecake was published in the Bangkok Post

Last book read: "The History of the City" by Lewis Mumford

Daily hours on the Internet: four to five

Daily incoming e-mail: About 500 messages (all answered)

Favorite Internet newsgroup: "I don't read news. I don't like it."

For more information: e-mail info@radio.com

After an hour and a half, I had about 12 megabytes, which was not quite half the show. I thought, "There's something wrong with this picture."

A You know what's wrong? You're trying to run it over 9,600-baud modems. And I'm not saying there's something wrong with the 9,600-baud modem, but if you're trying to get a 35-megabyte file, it doesn't make a lot of sense. It's like driving a huge truck down a little country road. On the other hand, there are roads out there that are big. There are literally 2 to 3 million people on the core of the Internet, people that have dedicated links, their network manager goes out in the middle of the night and brings it in, and in turn you have a 10-million-bit-per-second link into your corporate network. All of a sudden it takes a few seconds to get that file instead of six hours. So you can't look at something and say, "Gee, this isn't universal."

When CNN started cable TV and satellite-based systems, people in the country couldn't do it, and people in many areas couldn't do it. But you have to start someplace. What's interesting about our medium is the audience that can receive text on the Internet is now 30 million people. And the audience that could receive audio is 2 to 3 million. We're not trying to reach everybody, but we do have an audience of about 100,000 people in 30 countries.

Q You have put the Washington, D.C., restaurant Red Sage on the Internet by providing images from its menu and even a way to make reservations by fax. What was the point of that?

A This is the beginning of trying to get as many of the restaurants in D.C. as we can on the Net. The real reason we're doing it is, we're a public cyberstation. We're a nonprofit. Most of what we do is global in scope—things like SEC documents and U.S. patents. But we feel that as a Washington-based organization, we have to begin having local roots.

Q That's interesting, because usually the whole idea of something like a cyberstation is that it is no place. It's virtual. Net "citizens" can reside anywhere.

A People think of the Internet as a replacement for real life, and I think that's wrong. Electronic mail is part of the arsenal of things we do as human beings. It doesn't replace the phone, it certainly doesn't replace human contact.

The same thing with our cyberstation in D.C. Just because we're on the Net and anyone in Japan can get to us doesn't mean that we're not still human beings and a part of our community. It's not a replacement for the real world, and that's really important.

HarperAudio Debuts on Internet With Classic Tapes

Computer users can now listen to selections from Harper's Caedmon Audio imprint via the Internet.

Thanks to an agreement between HarperAudio and the Internet Multicasting System (IMS), subscribers can audit digitized 10-minute sequences of such writers as Robert Frost and Gwendolyn Brooks reading their own poetry, and obtain catalogue and purchasing information.

The nonprofit IMS is the first "radio" or "cyber" station on Internet, and distributes sound files to 100,000 multimedia computer users in 150 countries. The station—which can transmit audio, video and textual information—already distributes National Press Club luncheons, PBS-TV's *Computer Chronicles* and an interview show called *Geek of the Week*.

More than 400 10-minute excerpts from the Caedmon list are being made available. Each time an excerpt is played, the listener receives copyright information, Harper's 800 number and address, and instructions on how to order the tape or a catalogue via mail, phone or Internet E-mail.

According to Carolyn Willis HarperAudio marketing manager, the network offers three to six excerpts per week. Willis said the sound programs use a good deal of memory, and are likely to be accessed one or two at a time.

The Caedmon archive holds recordings of many of the 20th-century's most important English-speaking writers, including T. S. Eliot, Ernest Hemingway, Gertrude Stein, William Carlos Williams, Ezra Pound and H. L. Mencken.

Caedmon's list, acquired in 1987 as part of the HarperAudio launch, is conceded throughout the audio industry to be an audio "backlist" of the highest order, but is sometimes considered a white elephant in a province still dominated by bestselling titles.

Harper has begun using the line in a number of new ways, though, repackaging titles of historical significance and remastering short works for a line of single-cassette "Harper Classics."

"The arrangement will dramatically increase our exposure," said Willis. Under terms of the agreement, Harper will be the only spoken-word publisher associated with the IMS. For further information, call 1-800-CHARPER.

—MATT KOPKA

Broderbund To Merge with Electronic Arts

Electronic Arts, the San Mateo Calif.–based publisher of video games and software entertainment titles, has agreed to acquire Broderbund Software in a stock swap valued at about $400 million. The deal will create a software publisher with total sales of approximately $500 million; Electronic Arts has annual sales of about $400 million, Broderbund's sales are just under $100 million. The merger will also combine Electronic Arts' presence in the video game and international fields with that of Broderbund's strength in the education and personal productivity markets.

Included among Broderbund's product line is its agreement with Random House through which the two companies created a joint venture called Living Books (News, Sept. 13, 1993). Random House chairman Alberto Vitale called the EA-Broderbund deal "a very promising development," and added that "the development of Living Books continues full speed ahead." The EA-Broderbund deal could result in Living Books' titles being made compatible with the players developed by 3DO.

HOT DEALS

• America's media darling of the moment, **Nancy Kerrigan**, has sold her life story to the Walt Disney Company, which signed the inspirational skater last week to a wide-ranging agreement that embraces the company's television, theme parks and publishing divisions.

As part of the deal, represented by ProServ president **Jerry Solomon**, Kerrigan will write her memoir (with a still undetermined co-author) for the Hyperion Books for Children division of Disney. No details regarding the book were available at press time, although it will presumably not delve too deeply into the current controversy surrounding the skater and her competitor **Tonya Harding**, and it "will definitely not be done on an instant basis," said a spokesperson for the imprint.

To date there are five "instant books" (St. Martins, Ballantine, BDD, Times Books, Pinnacle) being rushed to market chronicling last month's attack on Kerrigan (News, Jan. 31, Feb. 7).

• Betting a second time on the sales potential of stand-up comedians, Bantam has just signed up veteran comic and sitcom star **Paul Reiser** to follow in the literary footsteps of fellow satirist **Jerry Seinfeld**, whose *SeinLanguage* continues its reign on the best-seller lists after more than six months in circulation.

Bantam Books is "mad about" comic Paul Reiser.

Announced last week by Bantam president and publisher **Irwyn Applebaum**, the deal was negotiated for an undisclosed advance by William Morris agent **Dan Strone**, who also represented Seinfeld. The book, scheduled for publication this fall, will be edited by Seinfeld's editor, Bantam senior editor **Rob Weisbach**, and has been described as a collection of humorous observations about life and love. Reiser is best known for his starring role in the current NBC hit comedy, *Mad About You*.

—MAUREEN O'BRIEN

In Loving Memory of Our Friend

SEYMOUR LAWRENCE
1927-1994

In this space we wish to make particular mention of Sam Lawrence's fierce, proud spirit as an independent publisher and his zealous devotion to the honor and value of his writers; moreover, to us, and to other independent booksellers who sought to help interest readers in his books, he was a friend like no other, constantly at our side with his every resource in the fight to make the world of books more like what his books were: perfect.

John Evans
Lemuria Bookstore

Richard Howorth
Square Books

TECHNOLOGIES ET MÉDIAS NOUVEAUX

Du français sur le « réseau des réseaux »

RFI diffuse un quart d'heure d'émissions quotidiennes en français sur le réseau américain Internet, le plus grand réseau informatique du monde.

EVOLUTION technologique oblige : la défense de la langue française passe par sa présence dans l'espace cybernétique – en clair, sur le plus grand réseau informatique au monde, l'américain Internet (1). Partant de ce sage principe, Radio-France internationale (RFI) diffuse sur le Net (comme on appelle familièrement Internet) près d'un quart d'heure d'émissions quotidiennes en langue française depuis le début du mois de mai.

Encore trop peu connu en France, Internet est peut-être le média le plus important du futur. Ce vecteur d'informations polymorphes – texte, son, images fixes ou animées – est aujourd'hui le plus développé et aussi celui dont la croissance est la plus rapide. Créé pour répondre aux besoins de la défense et de la recherche scientifique aux Etats-Unis, Internet est un gigantesque réseau informatique regroupant 20 000 sous-réseaux connectés les uns aux autres. Dans plus d'une centaine de pays, près de 30 millions de possesseurs d'un ordinateur personnel sont ainsi « abonnés » à Internet, par l'intermédiaire de différents serveurs. Ainsi reliés, ils sont en mesure d'échanger des informations et d'avoir accès aux services les plus divers (banques de données, revues de presse, etc.).

Comme la compression numérique permet de véhiculer sur ce réseau aussi bien du texte que du son ou de l'image, Internet s'est, depuis peu, lancé dans la radio. Parrainé par un certain nombre de sociétés privées, le Net a créé Internet Multicasting Service (IMS), en fait la première station de radio de l'espace cybernétique (à but non lucratif). Equipé d'un amplificateur (ou à l'aide d'une carte sonore), l'ordinateur personnel devient poste de radio. IMS, que l'on peut capter en direct ou en différé, a quelque 100 000 auditeurs dans une trentaine de pays et un taux de croissance de 20 % par mois.

Parmi ses programmes, IMS diffuse chaque jour plusieurs émissions de RFI : revue de presse française, « Une journée en France », « Parler au quotidien », « La vie privée des mots », notamment. Ce quart d'heure de français sur la plus développée des autoroutes de l'information devrait contribuer à consolider la communauté francophone électronique.

Grâce aux efforts de la mission scientifique de l'ambassade de France à Washington, cette communauté dispose déjà sur Internet de plusieurs messageries électroniques (Frognet, le club électronique des Français, Frogjobs pour l'emploi des scientifiques, Frogmag, un mensuel électronique, etc.).

Quand il s'agit de défendre la langue, la présence d'une communauté francophone sur le Net est, à coup sûr, plus efficace que l'autoritarisme linguistique d'un Jacques Toubon...

ALAIN FRACHON

(1) Pour se familiariser avec Internet, voir *The Whole Internet, User's Guide and Catalog*, éditions Krol O'Reilly and Associates, Inc. Ou, en français, *Internet pour les nuls*, éditions Sybex.

Mon professeur d'anglais est riche

« English Teacher » est une méthode de langue spécialement conçue pour tirer parti du Data-Discman portable.

LEONARD FREED/MAGNUM

DEUX professeurs habitués de l'audiovisuel – Brian Garfen et David Jarvis ont déjà à leur actif les émissions « VO » sur Canal + et FR3 – ont conçu une méthode de langue, « Sony English Teacher », pour tirer parti au mieux de la technologie de disque optique du Data-Discman, ce petit appareil portable que Sony cherche à relancer (*le Monde* du 8 avril).

Accès direct à n'importe quelle séquence, questionnaires à choix multiples, jeux, répétition des passages difficiles, la « navigation » est facile, avec des écrans qui obéissent toujours aux mêmes logiques, titres en haut, commandes en bas, exercices au milieu. Les dialogues sonores et illustrés qui ouvrent chaque leçon du niveau « débutant » (1), suivis d'exercices de compréhension, de vocabulaire, de grammaire, débouchent sur la vérification des acquis avec une version du dialogue, enrichie des textes écrits (et pour rassurer tout le monde, le livre complet fourni dans le coffret donne les traductions de toutes les leçons).

Plus que dans cette structure et cette progression classique, l'intérêt de la méthode tient dans l'interactivité, dans son pouvoir de « corroboration » (oui, c'est du français) instantanée : si l'on hésite ou se trompe sur une question, en se reportant au texte original, on tombera automatiquement sur la phrase pertinente, qui apparaît surlignée. Bref, au-delà du parcours personnel (que permet depuis toujours le livre, ses textes et ses images) et de l'indispensable référence sonore (apanage des cassettes), l'« English Teacher » offre une combinaison souple de ces éléments.

Les sons réels de chaque leçon en élargissent la portée. Car l'univers d'une langue, ce sont aussi les publicités, ou ces chansons qu'on fredonne sans en connaître le texte, ou quelques discours historiques qu'il faut avoir entendus en v. o. Ainsi les musiciens (nul hasard si le catalogue Sony Music est largement sollicité...) sont-ils convoqués comme témoins du temps, de Dylan aux Rolling Stones. De la politique au fil des années, on entendra aussi bien le fameux « I have a dream » de Martin Luther King que la déposition d'Oliver North, le « héros » de l'Irangate, sans oublier Bill Clinton. Au total, près de trois heures de son par niveau. Quant aux photos d'acteurs comme Jodie Foster, elles sont autant d'invites à entrer (en anglais) dans l'actualité, comme à revisiter ses souvenirs de cinéphile.

Au chapitre des regrets, on se lasse vite des encouragements prodigués à chaque bonne réponse de l'élève-spectateur, qui s'apparentent trop aux exclamations et aux rires enregistrés de « La roue de la fortune » (mais peut-être est-ce une partie de l'expérience culturelle ?). Le graphisme reste encore limité.

Enfin, comme toute méthode d'auto-apprentissage, son efficacité repose sur la volonté et une certaine forme d'assiduité. Du moins peut-on compter sur ce « professeur d'anglais » à tout moment et en toute circonstance, grâce à un casque et au faible encombrement de la machine. Ses promoteurs parient que la richesse du contenu justifie le prix de la méthode. Ceux qui craignent d'abandonner avant d'avoir assimilé toutes les leçons garderont toujours le « tableau noir » de cette méthode originale, une machine apte à visualiser d'autres « livres électroniques » (même si le catalogue est encore réduit).

M. C. I.

(1) La méthode est organisée en trois niveaux et trois « disques » : débutant, intermédiaire et avancé. Le premier niveau et le lecteur Data-Discman sont vendus en coffret à moins de 2000 F, les disques suivants sont vendus 200 F environ.

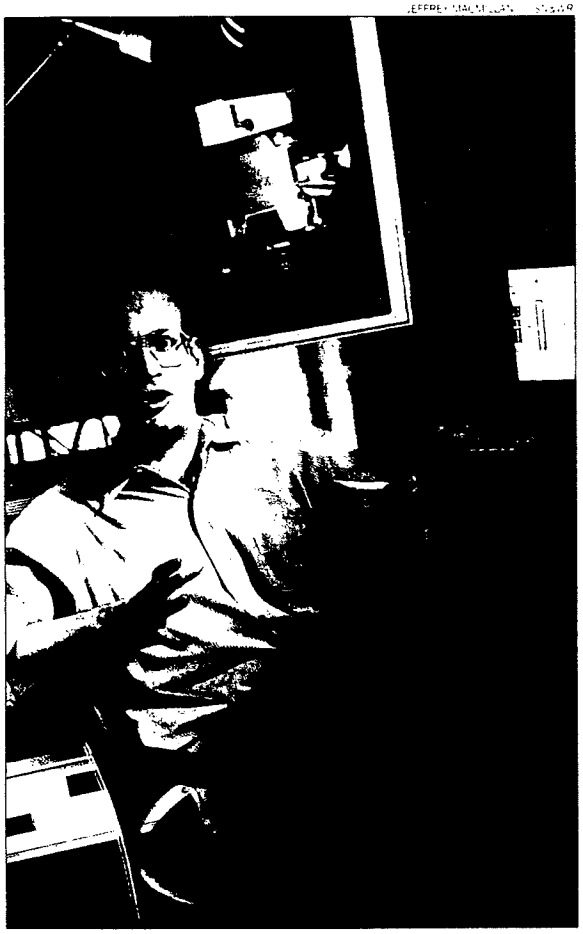
partnerships between cable, telephone and computer companies bent on providing interactive entertainment and home shopping. This fall, the Clinton administration added to the momentum, announcing a sweeping proposal to fund basic research and promote regulatory changes to help private industry create an "information superhighway" that will shuttle huge amounts of data around the world at lightning speed (conversation with Vice President Al Gore on Page 62).

No one knows what the ultimate impact of this information revolution will be. But the experiences of people who are already using bits and pieces of this wired world in their everyday lives suggest that it is likely to produce fundamental—perhaps wrenching—changes in our social fabric. Even in rudimentary form, the existing stretches of information superhighway are beginning to redefine the normal sense of community, the pace of intellectual life and, some say, the nature of knowledge itself.

Here and there. The most basic change resulting from the new technology will be its ability to erase the boundaries between "out there" and "here" by tying people together in ways unimaginable even a decade ago. Just as the interstate highway system decades ago enabled people to live outside town, away from their jobs, the information highway is creating "virtual communities" where people work together even if they live in a different state, time zone or country.

Nowhere is this more true than in the science community. The information superhighway eliminates the necessity for scientists to be in the same room with their equipment, says Jim Doll, a chemist at Brown University who uses the network to collaborate with a colleague in Hungary. "The machine can be on the far side of the moon for all we care." Likewise, researchers working on the multimillion-dollar Human Genome Project, the massive effort to identify all the genes in the human blueprint, are pooling their findings into a gigantic database available to anyone on the Internet. That's the vast skein of computer networks linking academic, research and government institutions that reaches tens of millions of people worldwide. The Genome Project database is just one of many in the scientific community that allow researchers instantly to compare their work with a central repository of information.

The virtual communities forged by scientists on the Internet are a harbinger of what may develop in many other fields. Scientists use the Net, as it is sometimes called, as a kind of electronic salon where they can instantly exchange text, sound, images, video or data, float a new idea for comment, pass around a résumé or advertise an opening for a position, and keep up with trends in their field almost anytime day or night and from anywhere around the world. During the storm of controversy over cold fusion several years ago, for instance, much of the initial scientific discussion of the announcement took place on the Internet, rather than at academic conferences or in the pages of scholarly journals. In contrast to the slow pace of publishing, the exchange produced a lightning-quick assessment that the experiments were flawed.



CARL MALAMUD

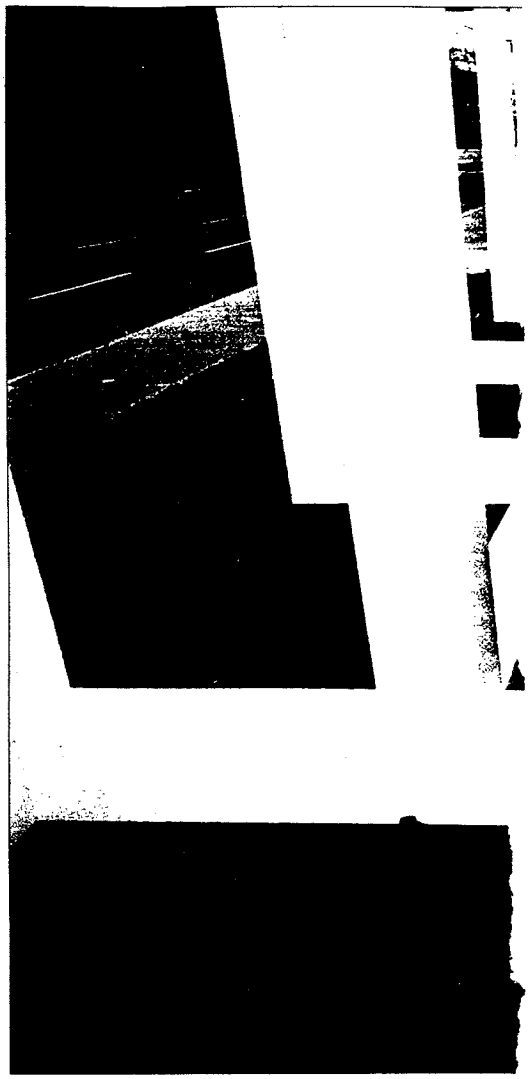
OCCUPATION: Internet entrepreneur, Washington, D.C.

CONNECTION: Founder of the first "cyber station" to broadcast audio (and soon video) on the Internet and host of "Geek of the Week." The digitized interviews with experts on science and society can be "downloaded" from all over the world.

LATEST ACHIEVEMENT: Putting corporate filings with the Securities and Exchange Commission on the Internet.

VERBATIM: "We need mom and pop digital delis on the information superhighway. A new technology's entrepreneurs never come out of the previous generation."

CONTACT: info@radio.com



インターネットのマルチメディア通信利用

始まった"パソコン放送"

まず米国に「ラジオ」

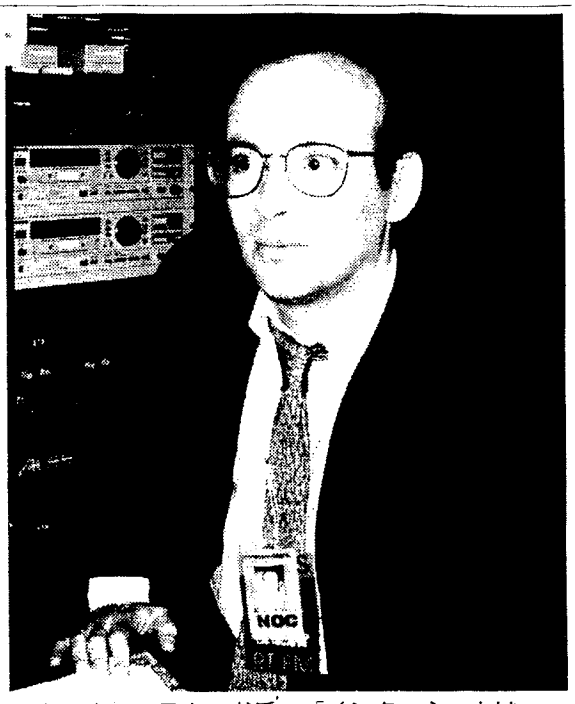
免許不要、国境ない強み

コンピューターのネットワーク「インターネット」が、文字情報のほか音声や画像も送り出し、ラジオ、テレビの領域に日に日に入り込みつつある。画質や音質はテレビ、ラジオに、まだかなわないが、免許もいらず、国境も超える新しいメディア。米国ではこれを使った新しいサービス「インターネット・トーク・ラジオ」が始まった。

（科学部・服部桂）

「最初のゲストは、商務長官のロン・ブラウン氏です。長官、聞こえますか？」。御切れのよい司会が始まった。ラスベガスで開かれたネットワークのショー「インターロップ'94」の会場に作られたスタジオ。司会者は「インターネット・マルチキャスティング・サービス」の社長カール・マラムッド氏だ。ブラウン長官が情報通信網の近代化をめざす情報スーパーハイウエーの民間への展開を説いた後、地元の下院議員、駐米フランス大使らのアピールが続く。

ラジオのトークショーのようだが、マラムッド氏たちの声が乗っているのはインターネット。聞き手はラジオやテレビでなく、コンピューターの端末で見聞きしている。



カール・マラムッド氏。「インターネットは従来のメディアを駆逐はしないが、確実に変容させる」と予言する＝米・ラスベガスで

もともとは文字しか送れなかったが、マルチメディアの普及で、デジタル信号にした音声や画像も送れるようになった。

マラムッド氏はインディアナ大で経済学を専攻していた元大学院生。コンピューターセンターでアルバイトをしているうちに、ネットワークの面白さにのめり込んだ。

「ネットワークの雑誌を出したかったんだけど、お金がなくてね。出版に金をかけるより、パソコンをネットワークにつなぐ方が、自分の主張を簡単に安く伝えられると分かったんだ」とマラムッド氏。

もちろん聞き手（読み手）のパソコンがインターネットにつながっていなくてはならない。だから最初の番組は、受け手を意識してネットワークの関係者へのインタビューだった。

インターネットを使う電子出版に興味を持つ出版社や、コンピューター会社からの援助で、去年の四月から本格的に活動を開始した。

各国のワシントン特派員が詰めているナショナル・プレスクラブの会見室で行われるランチョン・ミーティング（昼食会）の様子を流したり、ラルフ・ネーダー氏やダライ・ラマなど有名人とのインタビューを送ったり。

米証券取引委員会（SEC）のデータベースをもらいうけ、タダで公開もしている。

「最近は、フランスの国際放送が番組を提供すると言ってきた。日本語を学びたい人向けに、日本からも何か送ってほしいな」とマラムッド氏。

従来のマスメディアも大手のパソコン通信などを使って、似たサービスを始めようとしてはいる。「大手の新聞や雑誌はかなり衝撃を受けたようだが、まだ内容で勝負できると、おっとり構えている。彼のような新しいメディアを作るパイオニア精神が、必要なんじゃないだろうか」と、ニューヨーク・タイムズで彼を紹介したジョン・マルコフ記者。

「マスメディアは『何十万、何百万の視聴者を相手にしている』と言って、われわれを無視している。しかしこっちは、放送免許も要らないし、全世界の三千万人を相手にできるんだ。マスメディアがこのすごさに気づいた時は、遅い」とマラムッド氏は強気だ。

インターネット・マルチキャスティング・サービス

ワシントンのナショナル・プレスビル内にあるオフィスの中には録音用の小さなスタジオと、インターネットを使うための機器やワークステーションが数台あるだけ。企業の提供による太い回線で、外とつながっている。

音声のデータは大容量なので、細い回線ではそのまま流すとつまってしまう。通常の電話回線を使う場合は、後でファイルをダウンロードして、自分のパソコンで楽しめばよい。日本ではインターネットサービス会社のIIJが、こうしたダウンロードができるサービスをしている。

インターネット・マルチキャスティング・サービスの連絡先は、電話が、国際アクセス番号を回した後、一二二二六二八二三四、電子メール（インターネット）はinfo@radio.com。

BURRELLE'S

Users avoid fax costs with Internet messages

New York Times 3610

The dividing line between paper facsimile documents and electronic mail is vanishing.

Thanks to the volunteer efforts of a group of computer network designers, the network of networks known as Internet now permits users to send an e-mail message to be printed on fax machines at a growing number of sites worldwide.

Because Internet transmission charges are minimal compared with those of the long-distance phone calls normally used for faxes, the system is a cheap way to send faxes across the country or around the world.

To use the system, begun this month as an experiment in remote printing, computer mail users include a fax telephone number in the address portion of their message. The message, which may include text and graphics, will then be automatically routed to a site that has agreed to serve as a local geographic "cell" for delivery of the fax message.

So far, participating regions include all of Japan, Australia, the Netherlands and Ireland, and in the United States, Silicon Valley and parts of the Bay Area and metropolitan Washington as well as other pockets of the country.

Leading the project is Marshall T. Rose, a computer communications consultant at Dover Beach Consulting in Mountain View. He has worked with another Internet researcher, Carl Malamud, who has created Internet Talk Radio, a weekly commercial audio program that is distributed internationally and can be played on computer workstations.

The fax cell sites are computers on the Internet that also are connected to inexpensive computer-controlled fax modems that can route the files to virtually any fax machine.

Each site can designate the size of the area that it will serve — whether an entire city or just the fax machines within a particular company.

So far, in keeping with the utopianism that still permeates Internet culture, none of the fax intermediaries is charging for the services. Rose noted that the blurring of fax and electronic mail would raise thorny questions.

"Is this global and local bypass of the telephone companies using the Internet?" he asked rhetorically. "Is this legal? We need to think about this."

What's on the PC? It might be Internet multicasting

By WILLIAM A. RODGER

A new Washington-based medium is emerging on the Internet, the huge network of computer networks. It's called Internet multicasting and it blends radio, TV and computer bulletin boards.

Carl Malamud, 34, a highly regarded computer networking expert and author, plans to open eight Internet multicasting "cyberstations" in the U.S., Japan, the Netherlands, the U.K. and Australia this October. He launched the non-profit Internet Multicasting Service in the National Press Building a year ago.

"I'm not saying we're here to compete with interactive TV," Malamud said of his nine-person, multimedia Internet service, "but there will be a lot of people who are going to ask 'Honey, what's on the PC?'"

The development is important because it represents yet another means for corporate America — including advertisers — to reach consumers.

Internet users who dial up Malamud's computer server tap into a virtual radio station with dozens of recorded sessions as well as live programming. Each day they'll find two to three hours of "radio" news and feature programming they can listen to on their computer speakers, including speeches from the National Press Club, NPR's Soundprint and the 9:30 a.m. news from the Canadian Broadcasting Co.

And starting next week, the station will also have a half-hour of news daily from Monitor Radio of the Christian Science Monitor.

The service also carries all electronic filings from the Securities and Exchange Commission — in text form, naturally — as well as databases from the Federal Reserve Board and the Federal Election Commission.

Despite its non-profit status, more than $500,000 annually pours into Malamud's project from the likes of workstation maker Sun Microsystems, Internet publisher O'Reilly & Associates and computer show producer the Interop Co.

Internet access providers UUNET in Falls Church and Metropolitan Fiber Systems in Tysons Corner also provide Internet connections for a nominal fee. All sponsors get mentions on the air.

Tim O'Reilly, president of O'Reilly & Associates, a producer of a commercial shopping service on the Internet, said he expects a for-profit version of Internet Multicasting within two years.

A natural: Carl Malamud thinks cyberstations could compete with interactive TV.

"The Internet is a medium that's going through a lot of change, and it's really important to push the envelope," O'Reilly said. "That's why we sponsor this."

Although the interactive service doesn't use any new technology, it uses old technology in a new way, O'Reilly said.

The result is a test lab that will help companies that use the internet figure out what will work and what won't.

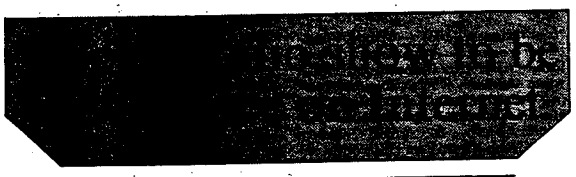
The biggest problem now, O'Reilly said, is that at 30 megabytes per hour of radio time, most people don't have the high-speed data links and large disk drives they need for Internet radio. Many will soon, though. Since TV cable companies and online services like America Online are already testing computer online services that would run over television cables to home computers, far wider distribution should be possible within the next year.

So, in five years, could you be listening and watching to the Internet instead of the latest from the local interactive TV company? Maybe, says Malamud.

"Here I can do my own MTV," Malamud says of the free-wheeling Internet culture. "It's like the difference between commercial online services and the rest of the Internet — that's the suburbs, this is the city. There are people who would rather live in Greenwich Village than the suburbs."

Bangkok Post
Established in 1946

Vol. XLVIII No. 6 BANGKOK WEDNESDAY JANUARY 6, 1993



YOU'LL soon be able to log onto The Internet and listen to the sound of Bangkok traffic or Thai temple bells through a new project called Internet Talk Radio, according to the pioneer of this soon-to-be-launched digitized international sound service Carl Malamud.

In Bangkok this week, busily recording sounds of city traffic and temple bells on a digital audio tape recorder and conferring with Ung Aang-Talay on the best restaurants, Malamud took time off to talk about his new "radio station" on the Internet to *Post Database*.

His ultimate objective is to stimulate "desktop broadcasting" and the aim of his programming, initially to be half an hour a week, is to serve as a world trade information service on networking in "this new global village."

He said that just as desktop systems were getting into multimedia, so was the Internet with support for dissemination of sound ranging from "bleeding edge" techniques such as multicast videoconferencing to more

by Tony Waltham

traditional protocols such as anonymous FTP and MIME extensions to SMTP mail.

As for the size of such files and the load they might pose on the Internet, Malamud said that with standard PCM compression and with a bandwidth of 64kbps — the sould quality of the best telephone lines in the United States — sound files would be 500 Kbytes in size for every minute of sound or a 15-Megabyte file for a half-hour programme.

He said he was working with UUNET on this and the aim was to take advantage of the unused bandwidth when traffic on the Internet was light.

Malamud said that at first, Internet Talk Radio — scheduled to start-up at the end of March — would use pre-programmed audio streams since the

Continued on Page 3

FROM PAGE ONE

INTERNET RADIO SHOW

bandwidth requirements of sound (16kbps-64kbps) were well suited to the current state of the overall Internet architecture.

He added that eventually he hoped to see the programming go live to provide a truly interactive medium with active listener participation.

Malamud already has two advertising sponsors in the form of Sun Microsystems and computer book publishers O'Reilly and Associates, and talk of Internet Talk Radio as combining the professional programming of radio with the worldwide reach of the Internet to create a brand-new medium.

What of objections by some as to how appropriate it would be to move these sound files that contain advertising over the Internet? Malamud admits that he is "pushing the limits" and has talked with the US Federal Communications Commission (FCC) who are interested since broadcasting is their domain. His programmes will be distributed free of charge, he added.

The Thai "sound bites" that he is recording here will be incorporated in his programmes in a segment known as the "incidental tourist" which will also contain reviews of restaurants and other places of interests.

The service will take advantage of recent advances in desktop systems to support video and audio on the computer, he noted, adding that the multimedia wave means that systems from Apple, NeXT, IBM, Sun, Silicon Graphics, DEC and many other vendors have some form of sound support.

Malamud added that Internet Talk Radio would be distributed throughout the Internet to some 106 countries using traditional file transfer protocols, with UUNET acting as the initial staging point. He said local and regional network managers would transfer the files to a local spool area and then "play" the data using techniques such as sending the data out to the local network through local multicast groups or by exporting the audio files as NFS file systems.

Programming will include a 30-minute weekly interview show "Geek of the Week" featuring prominent members of the networking community, and Malamud says that the show will have "the old-time radio feel, complete with corny theme song and Larry King-style interviews."

Malamud adds that the content of the show would be technical, focussing on networks and interoperability.

Internet now has over 10 million users and is growing at 15 per cent a month and has moved from a research prototype to a global infrastructure and Malamud hopes that his programmes "will introduce its many users to the people who have made this giant machine work."